Potential Impacts of a EU-US Free Trade Agreement on the Swiss Economy and External Economic Relations

July 2014

World Trade Institute, University of Bern
Hallerstrasse 6, CH-3012 Bern, Switzerland

Colophon

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Project leaders:
Thomas Cottier, WTI (Bern)
Joseph Francois, WTI (Bern) and CEPR (London)

Primary authors:
Thomas Cottier, WTI (Bern)
Peter Egger, University of Zurich, CESifo (Munich)
Joseph Francois, WTI (Bern) and CEPR (London)
Miriam Manchin, UCL (London)
Anirudh Shingal, WTI (Bern)
Charlotte Sieber-Gasser, WTI (Bern)

Client:
SECO - Staatssekretariat für Wirtschaft SECO

Date:
July 2014

Contact:
World Trade Institute
University of Bern
Hallerstrasse 6
3012 Bern, Switzerland

Phone: +41 (0)31 631 32 70
Fax: +41 (0) 31 631 3630
Email: inquire@wti.org

Summary

Background and mandate: In the wake of the recent financial crisis, in 2013 the European Union and the United States launched a joint, ambitious effort to boost their respective economies through a comprehensive trade and investment agreement. Known as the Transatlantic Trade and Investment Partnership Agreement (T-TIP), the negotiations process that has followed, and that indeed is still on going, is supposed to bring about tariff-free trade in goods, reduction of non-tariff barriers for goods and services, and liberalization of public procurement markets.

While tariff reductions are relatively straightforward, the main ambition with T-TIP actually relates to greater coherence and convergence of regulatory standards. The goal of regulatory convergence (and better cross-recognition of standards) is the most innovative and ambitious aspect of this venture. This goal requires enhanced cooperation in rule making, and so is not as straightforward as tariff elimination. Indeed, there is growing recognition that a successful T-TIP agreement would combine immediate liberalization in some areas with institutional mechanisms set up to allow progressive, long run liberalization in others. Such an institutional mechanism might have strong implications for a broader set of countries that are also grappling with regulatory barriers to trade and investment.

The planned agreement actually amounts to a set of trade agreements. While formally bilateral, it entails the 50 States in the US and 28 Members of the EU. It needs to take into account particularities of a great number of different partners and thus on substance amounts to a new type of mini-lateral agreement. Given its economic and political weight, as well as its mini-lateral character, the T-TIP is of substantial importance for the rest of the world, including Switzerland, which is not a member of the EU and operating her own external economic relations.

Because the T-TIP has potentially strong effects on third countries such as Switzerland, the present report integrates the findings from two studies mandated by the Swiss State Secretariat for Economic Affairs in September 2013 and undertaken by the World Trade Institute, University of Bern. The report summarized here presents the findings of those studies. The mandate for those studies called for analysis of the impact of T-TIP on Switzerland, and the implications of a parallel agreement between EFTA and the US. The focus of the integrated report is therefore on the implications of T-TIP for Switzerland. Except for the option of an EFTA - US Free Trade Agreement, it does not entail the examination of further policy options.

Methodological Approach: By its nature, a potential T-TIP agreement would imply immediate liberalization of some measures and progressive changes to regulatory mechanisms to address others. This means the prospects and shape of a likely T-TIP agreement, at this point in time, are difficult to assess. It furthermore means the Swiss place in such a framework is also difficult to assess. For this reason, this study takes a multi-pronged and multi-disciplinary approach. This methods used here include the following:

- Economic modelling of T-TIP scenarios with a computational model of the world economy (known as a CGE model), backstopped with market focused (partial equilibrium) modelling.
- Statistical analysis of procurement markets, FDI, and services trade

- Comparative analysis of the legal texts of existing agreements that might serve as templates for the T-TIP in critical areas

At the same time, we also examine alternative scenarios in terms of the outcome of T-TIP as it relates to Switzerland. These scenarios are made explicit in the scenario analysis under the CGE-based economic modelling. They are also implicit in the comparative legal analysis, where we need to keep in mind that the shape of the legal texts defining the agreement, and how these relate to Switzerland, also hinge on likely outcomes as spelled out in our scenarios.

The scenarios covered in this report cover both tariffs and non-tariff barriers (NTBs). It should be stressed that in contrast to reducing tariffs, the removal of NTBs is not as straightforward. There are many different reasons and sources for NTBs. Some are unintentional barriers while others reflect deliberate public policy. As such, for many NTBs, removing them is not possible because, for example, they require constitutional changes, unrealistic legislative changes, or unrealistic technical changes. Removing NTBs may also be difficult politically, for example because there is a lack of sufficient economic benefit to support the effort; because the set of regulations is too broad; or because consumer preferences or language preclude a change. In recognition of these difficulties, we follow recent studies by focusing on the set of possible NTB reductions (known as "actionable" NTBs) given that many will remain in place. Of those NTBs that can feasibly be reduced, we focus on different levels of ambition for NTB reduction.

Our formal scenarios are summarized in the table below. The scenarios range from a relatively shallow tariffs only agreement between the EU and US at one extreme to a deep agreement covering tariffs and NTBs and including a parallel EFTA-US agreement at the other. Between these we consider different coverage of the core T-TIP agreement, and different options for a parallel EFTA-US agreement. These scenarios do not mean that we believe one of these is particularly likely of preferred. Rather we simply need to use such a mapping to frame the questions, both empirical and legal, covered in the report.

1. *Tariffs only agreement*: Under this set of scenarios, we assume full elimination of industrial tariffs, and partial liberalization (50% reduction) of tariff barriers for agricultural products. Here we also examine what happens if there is an EFTA-US agreement in parallel with the core EU-US agreement on tariffs.

2. *Tariffs and modest NTB liberalization* (shallow NTB agreement): Under this scenario, we assume that 20 percent of actionable NTBs (those that can be reduced) actually are. This means a 20 percent reduction in trade costs associated with actionable NTBs. We also assume that these NTB reductions are discriminatory. Hence US liberalization would only benefit EU firms, and vice-versa. Again, we also examine what happens if there is an EFTA-US agreement in parallel with the core EU-US agreement on tariffs and NTBs.

3. *Tariffs and ambitious NTB liberalization* (a deep NTB agreement): Under this scenario, we assume that 50 percent of actionable NTBs (those that can be reduced) actually are. We also assume that not all of these NTB reductions are discriminatory. This reflects what are called "regulatory spillovers." Basically, with a deep agreement on NTBs, we assume that third countries also benefit to a limited extent, in terms of some improvement in market access. The logic is that, with deep regulatory reform, at least some of the changes are likely to affect all players, and not just the EU and US firms. For example, where the US recognizes EU standards, firms in other countries might then find it easier to meet US standards themselves. In addition, in the

Swiss case, through the MRA CH-EU, Switzerland is already streamlining/harmonizing its technical regulations with the EU's. Therefore Switzerland might be expected to actually benefit more from such any realized MFN spillovers than other third countries. Again, we also examine what happens if there is an EFTA-US agreement in parallel with the core EU-US agreement on tariffs and NTBs.

Possible Scenarios for T-TIP and Switzerland

	1. Tariffs only		2. Tariffs and Modest NTB agreement (A shallow NTB agreement)			3. Tariffs and Ambitious NTBs (A deep NTB agreement)		
	1.1 EU-US Agree-ment	1.2 EU-US and EFTA-US Agree-ment	2.1 EU-US Agree-ment	2.2 EU-US and EU-EFTA Agree-ment	2.3 EU-US and EU-EFTA Agree-ment (not tariffs)	3.1 EU-US Agree -ment	3.2 EU-US and EU-EFTA Agree-ment	3.3 EU-US and EU-EFTA Agree-ment (not tariffs)
EU-US agreement on tariffs	X	X	X	X	X	X	X	X
EFTA-US agreement on tariffs		X		X			X	
EU-US modest agreement on NTBs			X	X	X			
EFTA-US modest agreement NTBs				X	X			
EU-US deep agreement on NTBs						X	X	X
EFTA-US deep agreement NTBs							X	X
3rd country Spillovers from NTB reductions						X	X	X

Findings from Economic Modelling:

- A discriminatory and shallow EU-US agreement may be damaging to the Swiss economy.
- A deep agreement featuring convergence in EU-US regulatory standards should benefit the Swiss economy.
- Active Swiss involvement would benefit the Swiss economy (through flanking EFTA-US agreements).
- Different sectors will be affected differently

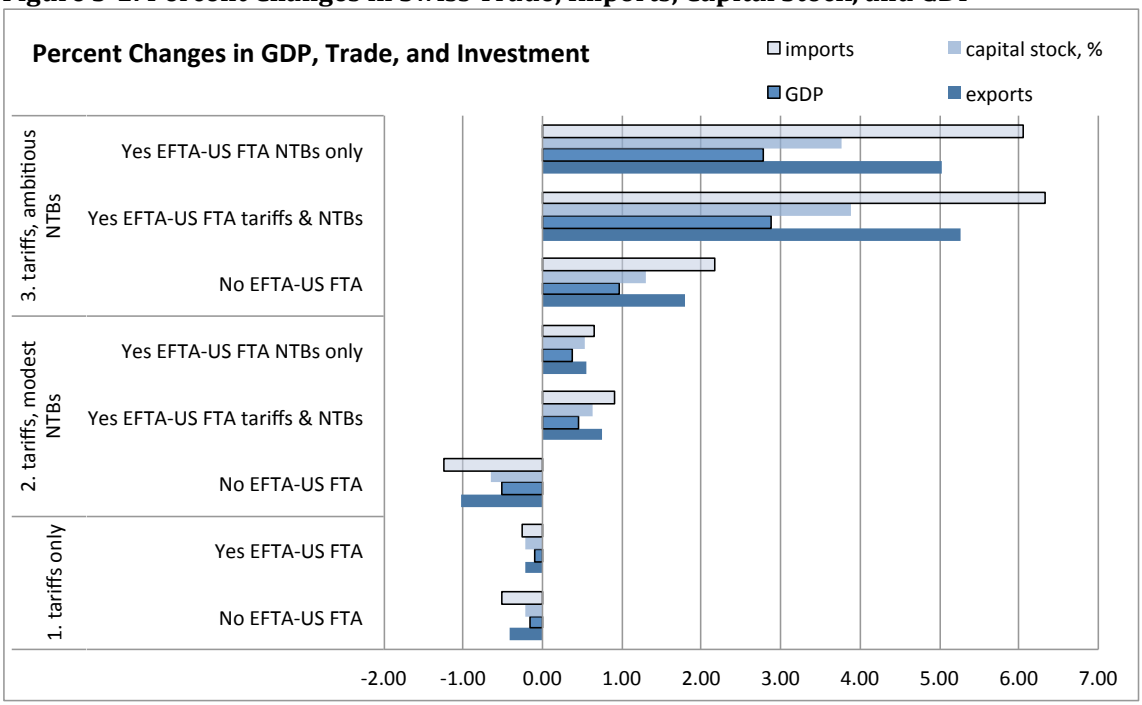
Our assessment of the possible impact of a T-TIP agreement on Swiss production and exports involves a set of computer modelling experiments, based on the scenario table above and rang-

ing from a passive Swiss response to T-TIP, up through negotiating a parallel agreement with the US.

Macroeconomic estimates are summarized in the Figure S-1 below, where in progression from Scenario 1.1 to Scenario 3.3, we move from Switzerland outside a tariff only agreement to a parallel EFTA-US agreement covering both tariffs and NTBs (including procurement markets). We should stress again (as covered in the report) that the deeper integration scenarios include regulatory spillovers. These therefore help to offset the trade diversion impact of T-TIP in the deep agreement scenario, at a macroeconomic level. In general shallow and preferential agreements that exclude Swiss participation harm the Swiss economy, with GDP changes ranging from -.17 (Scenario 1.1) to -.0.51 percent (Scenario 2.1). If there is a parallel set of EFTA-US agreements, the effects then range from basically nothing noticeable (-0.09 percent in Scenario 1.2) to +0.46 percent (Scenario 2.2 with a parallel EFTA-US agreement on tariffs and NTBs). When we move to deeper agreements (Scenarios 3) spillovers mean that Switzerland benefits even as a passive agent. As discussed in the body of the main report, spillover effects are quite important in driving the overall impact on Switzerland under the scenarios assuming a deep agreement. Here we estimate a GDP gain of roughly 0.96 percent from the T-TIP agreement itself, as Swiss firms benefit from greater regulatory coherence between the EU and US markets. With a deep core T-TIP and a flanking set of EFTA-US agreements, Swiss gains are as much as 2.87 percent of GDP (Scenario 3.2). Under this scenario we also see growth in investment in Switzerland (1.43 percent) and greater trade (5.27 growth in exports). In all cases, a parallel set of agreements involving EFTA more than compensate for investment diversion (falling investment) when Switzerland is an outside agent.

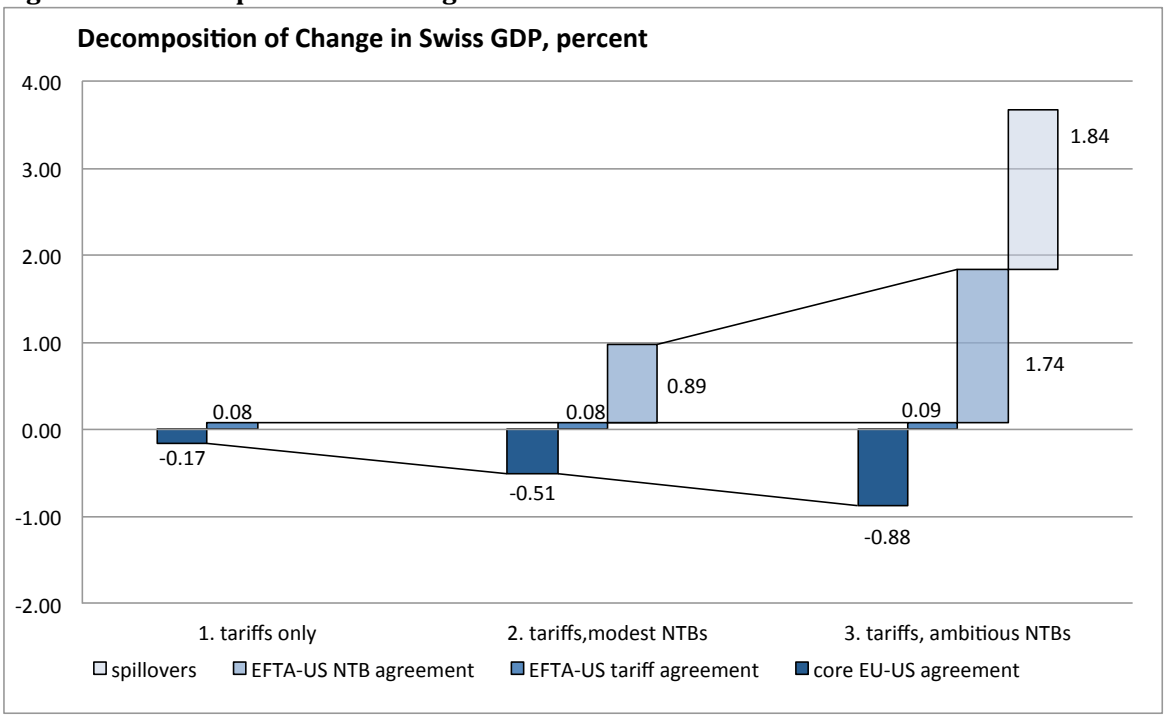
Based on the estimates in the main report and summarized in the figures below, the form that mutual recognition of standards might take under T-TIP is very important. With some NTB harmonization (and so effectively a reduction for third countries) between the EU and US, benefits can be expected for third countries (like Switzerland). This is one possible negotiation path. Alternatively if the solution for negotiated recognition of differences in regulatory systems is to establish some sort of deliberately discriminatory country of origin based mutual recognition mechanism for conformity assessments under divergent national regulations, third country exporters (including Switzerland) would then be worse off. We have illustrated the importance of spillovers in Figure S-2, where we have broken down estimated changes in Swiss GDP into the drivers of those changes. What we find is that regulatory convergence spillovers are central to the overall estimated impact of TTIP on Switzerland. Without this MFN element added to what is otherwise a preferential exercise, the impact on Switzerland is quite different. This finding illustrates the importance both of the core EU-US agreement (potentially quite negative), the benefits of a flanking agreement such as an EFTA-US agreement (potentially quite positive) and also the further benefits of regulatory streamlining (substantial gains from spillovers) as long as the EU and US do not pursue a deliberately discriminatory solution to these challenges.

Figure S-1: Percent Changes in Swiss Trade, Imports, Capital Stock, and GDP



Source: CGE model estimates in this study.

Figure S-2: Decomposition of changes in GDP

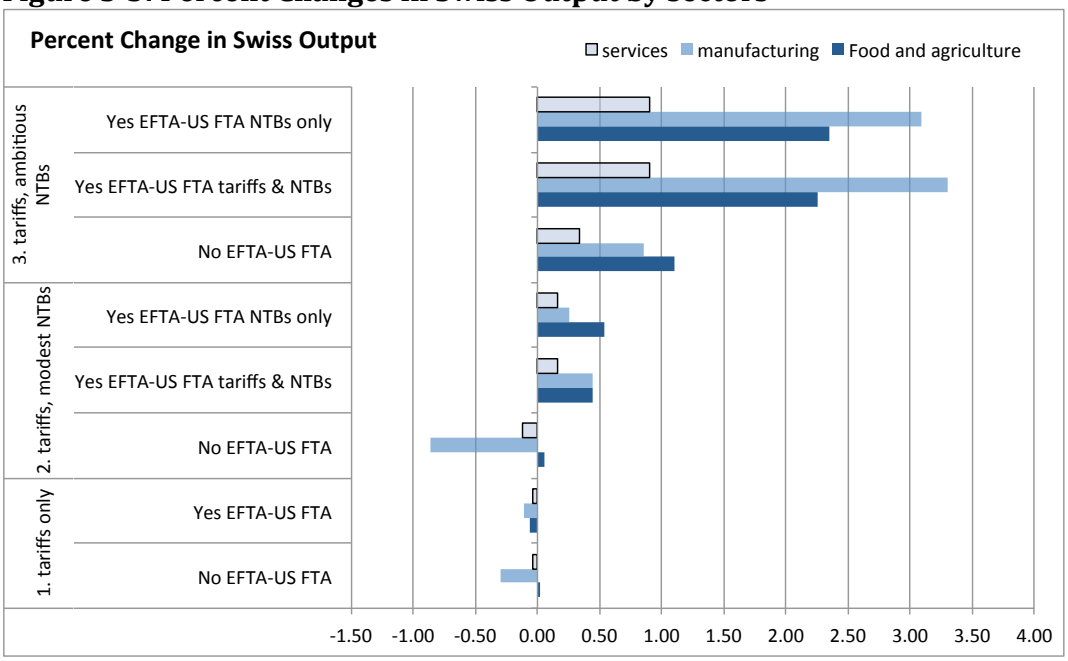


Source: CGE model estimates in this study.

It must be stressed that estimated spillovers are highly speculative, even more so than standard trade policy modelling. One reason is that, unlike old-style FTAs, the TTIP negotiations are different in that they offer scope for reducing unintended barriers in a way that might lead to standards adoption by third countries. The extent to which third countries then adopt a standard adopted by both the US and the EU, accounting together for a major share of world production and trade, is not something anticipated with old-style FTAs. Neither is the potential for effectively simplifying conditions for third country access to the US and EU markets. As such, apart from the single market process in the EU itself, we have little basis for gauging how large these effects might potentially be. It is clear from the analysis in the report, however, that the issue is central to the likely economic impact.

Sector effects vary across sectors, and depend heavily on the depth and width of the agreement, and whether there is a parallel EFTA-US initiative. This is illustrated in Figure S-3 below. Because both the US and the EU are highly protective of processed foods (including meat and dairy, but other foods as well) the Swiss processed foods industry is actually a potential net winner from T-TIP. Furthermore, turning to manufacturing, a combination of a parallel EFTA-US initiative together with spillover benefits from regulatory convergence could be quite beneficial to Swiss industry. However, like the overall impact on Swiss GDP, the impact on manufacturing again depends strongly on whether the EU-US agreement is purely bilateral, the depth of such an agreement, and whether or not it proves strictly discriminatory. These issues are examined in more detail in the report. Finally, in services fewer changes in market access policies are anticipated, and as such the effects are smaller than for goods. This is also examined in the report.

Figure S-3: Percent Changes in Swiss Output by sectors



Source: CGE model estimates in this study.

Findings from Legal Analysis:

- Past agreements suggest that progress in services is likely to be modest.
- A deep EU-US agreement may mean major changes in the competitiveness of Swiss firms in the EU market.
- The emphasis on standards and mutual recognition for service providers will place Swiss competitors under greater pressure mainly in the US while relations with the EU may be accommodated with the existing mutual recognition agreement (MRA).

Assessing the potential implications of services trade liberalization and mutual recognition in services related activities under a future T-TIP is difficult at this stage: as main parameters are not yet available, it does not go beyond guessing. A comparison of commitments in the EU Korean and the US Korean Agreement with US and EU GATS levels shows that levels of additional commitments made in services have generally been modest. At the same time, the actual pattern of trade in services in Europe, and the impact of FDI related regulatory barriers, points to scope for potentially large changes in the competitive structure of European service markets vis-à-vis US firms. These changes are likely to be adverse for Swiss services firms, who will lose competitive advantage relative to US firms in European markets.

The comparative findings on preferential market access in services induce a note of caution. Governments have been reluctant to grant extensive liberalization in preferential agreements going much beyond the levels of GATS. It begs the question whether this will be fundamentally different in EU-US relations. There are fundamental objections on the part of the US to include financial services, and reservations were made on the part of the EU to include cultural services. At the same time, there is a considerable potential that US companies will achieve competitive advantages in EU markets due to the fact that Switzerland still does not have a PTA in Services with the EU. We therefore conclude that independently of T-TIP, Switzerland's competitive position in services vis-à-vis the US in the European Market hinges on free movement and services trade with the EU. A T-TIP agreement will in any case provide a competitive advantage vis-à-vis Switzerland for the EU in the US market.

The strong emphasis on non-tariff barriers in T-TIP, addressing behind the border issues, indicates that better standards recognition and acceptance of testing and admission will be an important feature facilitating transatlantic trade. The same holds true, particularly for the US market, for cross-recognition of the diplomas and certificates of service suppliers. While Switzerland can build upon both its MRA and its agreement on the free movement of persons with the EU, a similar instrument in trade relations with the US has been missing.

Procurement markets:

- Swiss suppliers are major players in EU procurement, and so T-TIP may erode their position in these markets, especially in services.
- The WTO may offer an opportunity to rebalance access conditions for procurement.

Our analysis on the likely impact of potential government procurement liberalization in the TTIP on Swiss suppliers and service providers includes both qualitative and quantitative assessments. Our qualitative analysis discusses the potential areas and issues of interest that are likely to form a part of the negotiations. These include inter alia liberalization of sub-federal procure-

ment including parity in contestable thresholds, and coverage of procurement undertaken by utilities.

Our quantitative assessment identifies sectors important from a market access perspective for EU and US suppliers and service providers in each other's procurement markets. These include other commercial services, transport services, chemicals-rubber-plastics, food-beverages-tobacco, transport equipment, electronic equipment, machinery and equipment, motor vehicles and parts and metal products. Our analysis suggests that Swiss suppliers and service providers are also significant players in these sectors in both markets. Successful coverage of these sectors in the TTIP would therefore enhance market access on either side that may have adverse implications for Switzerland. However, any adverse effects for Swiss suppliers and service providers are more likely in the services sectors, which are not only more differentiated but where public demand as a share of output is comparatively larger in both the EU and the US than is the case for goods.

We also consider procurement liberalization in the recently negotiated Canada-EU CETA as a benchmark in our analysis and conclude that reciprocal liberalization of sub-federal procurement in the TTIP may lead to greater challenges for Swiss suppliers and service providers in EU and US markets.

Foreign investment and intellectual property:

- Swiss firms should benefit from IPR aspects of T-TIP.
- Swiss service MNEs may lose competitive position in Europe under T-TIP, based on current trade and investment patterns.
- Swiss MNEs may benefit substantially in the US market, through spillovers and through Swiss subsidiaries in the EU.

Through the WTO, Switzerland is entitled to Most-Favoured Nation (MFN) treatment independently of existing levels of protection in the TRIPS Agreement. Any improvement achieved under T-TIP in the field of IPRs will be subject to Article 4 of the TRIPS Agreement. This means that if levels of protection and enforcement increase in EU-US relations, Switzerland and other Members of the WTO are entitled to obtain treatment no less favourable. This is an important source for spillovers that would enhance Swiss interests. Overall, Switzerland is therefore likely to benefit from spillover effects of advancements of IPR protection in the T-TIP.

Our analysis of FDI data (econometric modelling) suggests that the incentive for Swiss MNEs to relocate operations to the European market needs to be taken into consideration. With a head office in the EU, Swiss companies could get unrestricted access to the European market, the full advantages of market access of the T-TIP in the US market, and still have market access to the Swiss market secured through the close trade relations between the EU and Switzerland. Especially when the procedural benefits in Investor-State arbitration in the T-TIP turn out to be substantial, such incentives may be further reinforced. As in the case of direct services trade, we find scope for erosion on the competitive position of Swiss firms operating in the EU following from reduction in barriers that impact on the foreign presence of firms in Europe.

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I. Introduction

In July 2013, the European Union and the United States launched bilateral negotiations towards an enhanced transatlantic partnership in trade and investment. Under the heading of Transatlantic Trade and Investment Partnership Agreement (T-TIP) a comprehensive and ambitious effort to boost the economies in Europe and North America following the financial and debt crises was launched, unprecedented so far. The project is supposed to bring about free trade in goods, removing tariff and non-tariff barriers, to include liberalization in services, public procurement and to foster mutual investment protection. The main ambition relates to greater coherence and convergence of regulatory standards, and thus of enhanced cooperation in rule-making. The topic of regulatory convergence perhaps amounts to the most innovative aspect of this venture.

The effort complements EU and US efforts to foster multilateralism in a long-term perspective. Given the new geopolitical constellations and the difficulties to advance an ambitious agenda in the WTO, any future agreement between the US and the EU, entailing more than 30% of World Trade and 50% of World GDP, is likely to provide the template for future international rules on trade and investment.

The effort is part of a larger context shifting the emphasis to preferential trade agreements worldwide. Major economies are involved in a more or less simultaneous round of talks on various bilateral and regional trade and investment agreements. For example, the EU is engaged in negotiations with countries as far ranging as Central America, South East Asia, East Asia, and North America. The negotiations for deep agreements with core OECD economies go far beyond tariffs, emphasizing non-tariff barriers (NTBs) to trade and investment. This also includes the Trans-Pacific Partnership Agreement (TPP) the EU-Canada FTA, the EU-Korea FTA, and the US-Korea FTA.

In this context, Switzerland is firmly embedded within the multilateral trading system of the WTO while pursuing at the same time an active policy of preferential trade agreements mainly with emerging economies. At this time, Switzerland is a party to 28 Free Trade Agreements. While the country has extensive treaty relations with the European Union, relations with the United States essentially rely upon WTO law.

This constellation provides the background for assessing the potential impact of a future comprehensive trade and investment agreement between the United States and the European Union on the Swiss economy and Swiss external economic relations.

Little is known to date on the specifics of the trade agenda of the Transatlantic Trade and Investment Partnership (T-TIP) between the United States and the European Union. While negotiations have started, draft texts are largely confidential for the time being, and the public is only provided with limited access to information. Today, the T-TIP negotiations are primarily aiming at diminishing so-called 'non-tariff barriers to trade' (NTBs). Discussions are on-going, to what extent investment protection with private

state arbitration will be included in the treaty, if financial services are to be part of the T-TIP is furthermore discussed publicly, and there are interesting suggestions for the institutional framework for regulatory cooperation brought forward by both sides. Overall, we do not know when the draft texts of an agreement will take final form. Moreover recently concluded trade agreements, which could serve as a benchmark, are not yet available, in particular the Canada EU Comprehensive Trade Agreement (CETA) and the Trans-Pacific Partnership Agreement (TPP) which is slightly ahead of time, but still remains to be completed. Similarly, the future scope of a plurilateral trade in services agreement (TISA) has not yet materialized.

Given the state of the play, the study attempts to assess potential implication on the basis of econometric models and comparative legal analysis. It goes without saying that precise predications are impossible at this stage. Yet, the scenarios tested allow identifying broad trends and drawing preliminary conclusions for trade policy of Switzerland.

This study seeks to inform the Swiss government and economic actors, and to contribute to a currently lively debate on this agreement in the making.

A. Background of the Mandate

T-TIP negotiations between the United States and the European Union seek to reduce existing trade barriers in goods and in services. While reduction of tariffs remains important, the emphasis is on non-tariff barriers, seeking to streamline regulatory convergence and cooperation between the United States and the European Union. The scope of negotiations is essentially defined by the disciplines of WTO law, which include trade in goods (including technical barriers to trade and food standards), services, intellectual property protection and government procurement. Additional plurilateral disciplines include investment protection. The project is legally bound to follow the patterns required by GATT Art. XXIV and GATS Art. V: essentially the elimination of substantially all barriers to trade is required within transitional periods basically not exceeding 10 years upon the entry into force of the agreement. The T-TIP is scheduled to address all pertinent areas of international trade regulation, including government procurement. Moreover, the project seeks to reinforce disciplines on protecting foreign direct investment. Overall, the agreement is expected to generate considerable trade creating effects, in particular in terms of job creation in the United States and in the European Union. Estimates guess that average household income in the European Union could be increased by more than 600 € annually. (European Commission, 2013b).

The planned agreement amounts to a new generation of trade agreements. While formally bilateral, it entails the 50 States in the US and 28 Members of the EU. It needs to take into account particularities of a great number of different partners and thus on substance amounts to a new type of mini-lateral agreement. The T-TIP thus is of substantial

importance for the rest of the world, including Switzerland, which is not a member of the EU and operating her own external economic relations. Third countries, such as Switzerland, on the one hand will benefit from trade creation and spillover effects of enhanced cooperation between the two largest trading blocks. On the other hand, they will be subject to potential trade diversion effects

B. Content of the Mandate

The present study mandated by the Swiss State Secretariat for Economic Affairs in September 2013 combines two studies undertaken by the World Trade Institute, University of Bern, in cooperation with the Center for Economic Policy Research, London. The authors were selected upon submitting proposals in a tender process and requested to assess the potential impact of a future Free trade Agreement between the United States and the European Union.

A first study undertaken by Professor Joseph Francois WTI, Professor Peter Egger, ETHZ, and Miriam Manchin, CEPR, assesses the potential impact of the T-TIP on Switzerland using CGE based methods. The study covers both trade in goods and in services. It offers an overall account and estimation. The second study undertaken by Professor Thomas Cottier, Professor Peter Egger, Professor Joseph Francois, Dr Anirudh Shingal and Charlotte Sieber-Gasser of WTI assesses particular areas of interest. The study focuses on a number of service sectors, regulatory barriers affecting FDI in services, and government procurement.

This joint report reflects subsequent work and methodological adjustments following a workshop with SECO on February 10 2014. The input of SECO has been particularly valuable in this regard. For example, while the second study draws on a comparative analysis of existing agreements on services while ignoring the Canada–EU agreement, which is not yet available, strong emphasis is placed here upon a comparison with the US and EU agreements with Korea instead. Moreover, the qualitative and quantitative assessments of services are based upon three different scenarios of deep, weak and lacking levels of integration.

Given the early stages of the negotiations, the mandate is limited to the analysis of potential implications and does not include policy recommendations.

C. Approach

Given the early and forming stages of the negotiations in 2013 until March 2014, the studies cannot rely upon existing conceptual papers, let alone draft texts of the agree-

ment. This is a very early stage, and any assessment necessarily remains contingent upon factors not yet determined in the process of negotiations. Information on the negotiating process is scarce and sketchy and largely dependent upon published materials, either by the EU Commission or USTR or Inside US Trade. At this point in time, the main parameters of the T-TIP beyond broad coverage and particular emphasis on regulatory cooperation are not yet defined. Whether or not key sectors, such as financial services will or will not be included is unsettled at this point in time. Likewise, it is unclear to what extent disciplines on government procurement will be extended to US States or not.

Given this background, the CGE model works under a number of assumptions depicting different levels of liberalization and integration potentially envisaged. The method applied is based upon similar estimates undertaken for the EU by CEPR. Based upon actual and aggregated trade flows, trade creating and trade distorting effects on Switzerland are being assessed.

Our analysis of specific services sectors of interest to Switzerland is based upon three approaches. Firstly, the study compares existing FTAs of the EU and the US in these sectors. The respective agreements with South Korea are of paramount importance, since the commitments relate both to highly developed economies. The text of the Canada-EU Trade Agreement (CETA), of leading interest, has not been made available at this point in time and could not be considered in the study. Secondly, we anticipate different levels of market access liberalization in sectors of interest and extrapolate such levels on the basis of existing patterns of trade and investment. Trade creation, diversion and spillover effects are assessed for these different levels, which may or may not be adopted during the negotiations. Third, we examine actual levels of trade in Europe with a gravity model of trade, supplemented to include information on barriers to FDI in services. The results of the gravity model support and reinforce the messages derived from the more qualitative analysis of existing agreements.

The work on government procurement essentially relies upon existing market access and extrapolates the effects should the US procurement market be opened on a preferential basis excluding Switzerland in both the United States and the European Union. Finally, the study addresses a number of particular issues relating to investment protection and intellectual property and trade in licensing.

Based upon the assessment that inherently is preliminary given the early stage of negotiations, the assessment formulates a number of recommendations beyond the options of joining T-TIP. These recommendations relate to negotiating an FTA on services with the European Union, and progress on standards, both in goods and in services, with the United States. Importantly, these recommendations are not contingent upon the implementation of T-TIP but should be pursued independently of the conclusion of the T-TIP Agreement.

II. The T-TIP in the Context of the World Economic Order

Until quite recently, international economic law could generally be distinguished into two fora: the preferential forum and the multilateral forum. Switzerland, like all other industrialized members of the WTO, participated in both fora by being a member of the WTO and simultaneously concluding a number of preferential trade agreements (PTAs). PTAs are inherently in conflict with the multilateral trading system, since the core of WTO law essentially is to provide non-discriminatory access to the global market. A PTA, however, is by its nature discriminatory, since third countries are excluded from the benefits of the preferential treatment provided in the PTA.

Because of the delicate regulatory relationship between the preferential and the multilateral regulatory forum, WTO-law attempts to establish requirements for the exemption from Most-Favoured Nation Treatment (MFN) obligation for PTAs, which in theory ought to secure the overall regulatory coherence of international economic law and minimize the negative impact of a PTA on third countries. The most prominent provisions regulating the MFN exemption for PTAs are GATT Art. XXIV and GATS Art. V. Both require a PTA to be covering substantially all the trade in goods and services respectively, in order to qualify for an MFN exemption. However, as a consequence of the relatively vague language and non-existing enforcement-mechanism in the WTO both GATT Art. XXIV and GATS Art. V are of limited relevance in practice: At closer sight, most PTAs in force today do not meet all of the requirements.

While this has been a matter of general concern for WTO specialists for some time, the on-going negotiations on the so-called 'mega-regionals', such as the Trans-Pacific Partnership (TPP), and the Transatlantic Trade and Investment Partnership (T-TIP) further increase concerns over the weak implementation of the regulation of PTAs. Even though members of the TPP and the T-TIP have repeatedly stressed that they plan a PTA in compliance with GATT Art. XXIV and GATS Art. V, it will remain open until the final agreement is concluded, to what extent the requirements of WTO-law translate into the scope and structure of these agreements.

The weak implementation of the regulatory provisions of PTAs means that it is impossible to provide for a relatively safe assumption as to what the regulatory scope of the T-TIP could look like. While in theory the general idea and scope as established by GATT Art. XXIV and GATS Art. V ought to provide for a basis of such a prediction, in practice – especially when considering also the political power of the two parties involved – anything is possible and the T-TIP could essentially even ignore the requirements of GATT Art. XXIV and GATS Art. V altogether since it is unlikely that this would have consequences.

If the US and the EU decide not to implement GATT Art. XXIV and GATS Art. V in the T-TIP, this would further weaken the *de facto* argument of WTO-law as the basis of international economic law, providing for general rules and minimal standards applicable to all WTO-members. Weak multilateral regulation would particularly harm small economies, such as Switzerland: WTO-law protects the interests of small economies and establishes a level playing field independent from economic and political power. Thus, arguably, it is in the interest of Switzerland to stress the importance of GATT Art. XXIV and GATS Art. V, and to highlight the fact that by the law, the T-TIP is forced to comply with these provisions.

On another side, most of the liberalizing impact of PTAs today is achieved through mutual recognition and the reduction of non-tariff barriers to trade. Given that the level of tariffs worldwide has been continuingly reduced to a low level of just about 4% in average today, the reduction of non-tariff barriers to trade in a PTA is economically more relevant than the level of tariff-reductions. In fact, more than 80% of the gains from T-TIP are expected to come from the lower costs of bureaucracy and regulations.[1] Global trade in goods today is increasingly further liberalized through regulatory convergence. While the majority of WTO-members agree on this, multilateral negotiations have so far not resulted in any major regulatory convergence since the establishment of the WTO in 1995. Countries have, thus, attempted to increase regulatory convergence through PTAs, which resulted in numerous different approaches and regulatory systems.

It is the declared goal of the US and the EU to reduce non-tariff barriers to trade through regulatory convergence. Should they agree on major reductions of non-tariff barriers to trade, they will in fact establish a prototype for any subsequent regulatory initiative in reducing non-tariff barriers to trade. Provided that these economic giants agree on a certain standard, it is likely that the rest of the world will follow their lead sooner or later, if they want to secure market access to the most attractive domestic markets today. While Switzerland will most likely be able to implement such potential T-TIP based regulation, other – and in particular poorer – countries, will be struggling in keeping up with the world's leading economies.

Thus, reducing non-tariff barriers to trade in the T-TIP, while constituting the declared goal of the negotiations, is not necessarily in the interest of third countries, such as Switzerland. Regulatory convergence in the T-TIP will serve as a regulatory prototype for subsequent economic integration worldwide. The jury is still out, whether and how third countries which implement such PTA regulation will have to be given equal treatment. Switzerland in any case will have the opportunity to implement the T-TIP regulation unilaterally and will have to ask for participation in negotiations over mutual recognition. It is likely that a substantial reduction of non-tariff barriers to trade in the T-TIP will eventually lead to a number of WTO disputes, which have to clarify the relationship between MFN and mutual recognition, as well as to further substantiate the scope of equal treatment.

[1] T-TIP, Excerpt from Inside US Trade, December 13, January 14.

A. Institutional Issues and Regulatory Convergence and Cooperation

The emphasis of the T-TIP will be on non-tariff barriers or what today are called behind the border issues. The main challenge consists in bringing about simplification of trade and investment while protecting public interests, by means of mutual recognition or even harmonization of standards and rules.

It is the declared goal of the US and the EU to reduce non-tariff barriers to trade through regulatory convergence (see also Lester and Barbee 2014). Proposals on the table are of great interest. They depict the long-term architecture of the Agreement and its philosophy as a framework and forum for lasting discussions. T-TIP very likely will not be a static agreement modelled after traditional PTAs. It will be framework within which a process of common rule-making and standard setting in concertation with domestic prerogatives and powers will take place. Mutual dialogue and hearings are at the centre of it. Proposals do not suggest undermining domestic law-making, and certainly not the prerogatives of Congress and Parliament. Much of the experience within the EU may translate into transatlantic procedures. It is too early to assess the prospect of these plans. As in the context of the transatlantic dialogue, they may become the victim of vested interests in government and administration. Both the EU and the US are accustomed to work with their own templates. This no longer will be possible and common templates need to be developed.

To the extent that regulatory convergence materializes, the results will offer a template for subsequent multilateralization, both in the WTO and by means of PTAs. They will in fact establish the prototype for any subsequent regulatory initiative in reducing non-tariff barriers to trade. They will inform much of the work of the WTO in coming decades.

Regulatory convergence between the EU and the US provides important spill-over effects for third countries. Switzerland is able to benefit from common standards both for the EU and the US. She will be able to extend her policies of Euro-compatibility to policies of transatlantic compatibility. Much of this can be achieved unilaterally by subsequently adjusting to existing norms of the main trading partners under the existing legislation on technical barriers to trade, or in adjusting, or enacting new, legislation. Limited participation in the process of rule-making does not fundamentally differ from today, but may be further accentuated. Better EFTA engagement in the process may be an option, which, of course, would depend on the EU and the US and to what extent the agreement subsequently will be open to others to join. It may lead to reviewing current relations with the EU from the point of view of democratic participation.

III. Modelling the Economic Impact of T-TIP on Switzerland

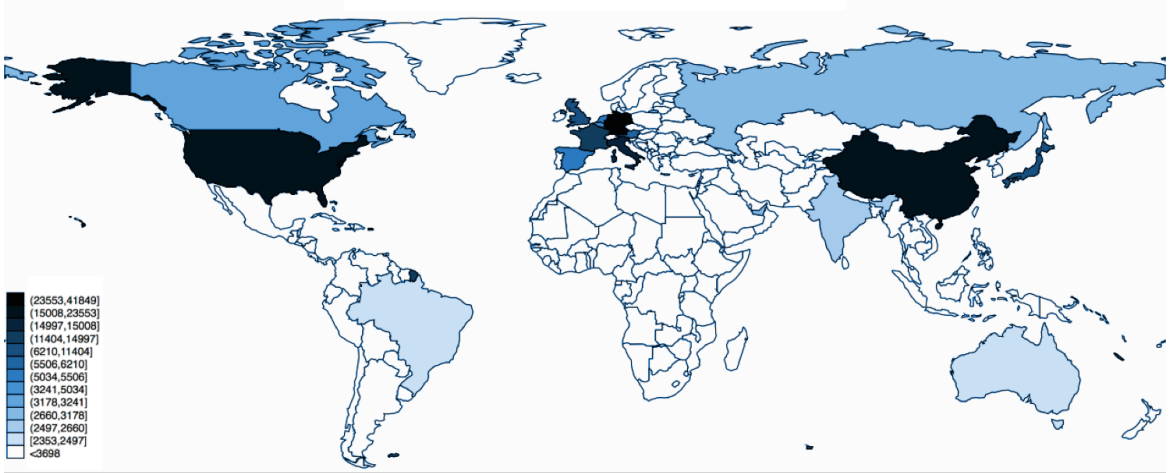
In this section, we examine the possible impact of T-TIP on Switzerland. The impact depends on possible changes in policy as discussed below, as well as the structure of the Swiss economy itself. We start with a discussion of policy and possible scope for liberalization, and move on from there to the model-based assessment of possible scenarios.

A. The Structure of Swiss Trade and Investment

Ultimately, the impact of TTIP on the Swiss economy depends on a number of factors. These factors include the direction of trade and the structure of the Swiss economy itself, as well as likely changes in policy under TTIP. We deal with changes in policy throughout the rest of this report. We start here with an overview of the underlying economic structure. This serves to set both the more qualitative regulatory analysis and the more quantitative CGE analysis in context.

Figure III-1 depicts the twenty most important export and import partners of Switzerland in 2012. The US and the EU are among the most important trade partners for Switzerland as can be seen from the figure. Thus any agreement affecting the trade relations between the two is likely to have an important impact on the Swiss economy.

Figure III-1: Switzerland's top 20 export destinations, million Swiss francs



Source: WITS, World Bank, own calculations.

The EU is the single most important trade partner in manufacturing for Switzerland, fol-

lowed by China, and the US (in 2012). Switzerland enjoys privileged tariff and NTB access to the EU market vis-à-vis the US. This privilege will be eroded with a TTIP.

Like other high-income countries, Switzerland is services-intensive in terms of value added (meaning employment and capital) but goods-intensive in terms of trade. Figure III-2 below provides a summary for 2011. The figure provides three measures of the contribution of sectors to trade and GDP. The first is simply the share of value added (the basis for the value of national income) across primary production and food, manufacturing, and services. On this basis, services contributed 78.2 percent to Swiss GDP, while manufacturing contributed 18.6 percent and primary production and food 3.2 percent.

In addition to GDP allocations across sectors, throughout this section we will also refer to economic *linkages*. By this, we mean the extent to which output from one sector then feeds into another sector. This flow of output of goods and services is the basis for the concept of "value chains" linking the activities (value added) in sectors at various stages of processing, leading ultimately to the final output of goods and services. When one focuses on the downstream flow of output to final output – for example steel sold to motor vehicles production and to construction – this is referred to as forward linkages. When we instead examine the original sectors providing value added to final output in a given sector – for example steel, electricity, engineering services, and machinery all feeding into motor vehicle production – this is referred to instead as backward linkages. Backward linkages help to identify the importance of workers and production in upstream firms contributing to final output.[2] Linkages are an important feature in the model of production and trade – the CGE model – discussed later in this report.

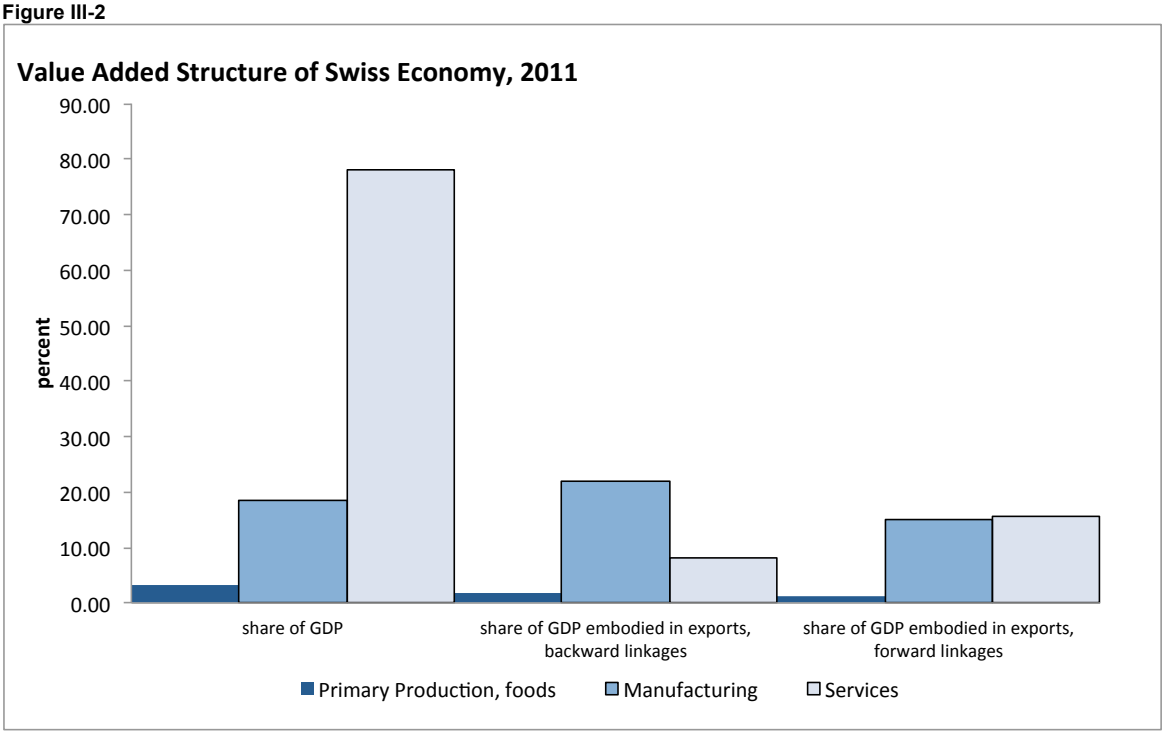
In terms of Figure III-2, we provide the contribution of exports to GDP based both on forward linkages and on backward linkages. Starting with backward linkages, 21.94 percent of Swiss GDP (jobs and capital services) was exported through goods. Services exports accounted for another 8.01 percent. In the case of manufacturing, these figures include not only value added within manufacturing, but also value added from services that feed into manufacturing output. In total, 31.69 percent of Swiss value added is exported. Most of this is exported through the manufacturing sector.

While manufacturing accounts for most of Swiss value added contained in exports, much of this actually comes through inputs from the service sector to manufacturing production. This is clear when we look at the last set of data in Figure III-2 on forward linkages. Here, we see that 15.03 percent of Swiss GDP, located in the service sector, is embodied in exports of goods and services. This figure points to the important role the service sector plays in Switzerland as an intermediate input to goods production, including for example engineering, ICT, and financial services. Given the nature of the Swiss economy,

[2] For a technical discussion on the definition of these concepts and their calculation from national input-output data, see Francois, Manchin, and Tomberger (2013) and Christen et al (2013). Here, in this section we work with the GTAP9 database, which is benchmarked to the global economy in 2011.

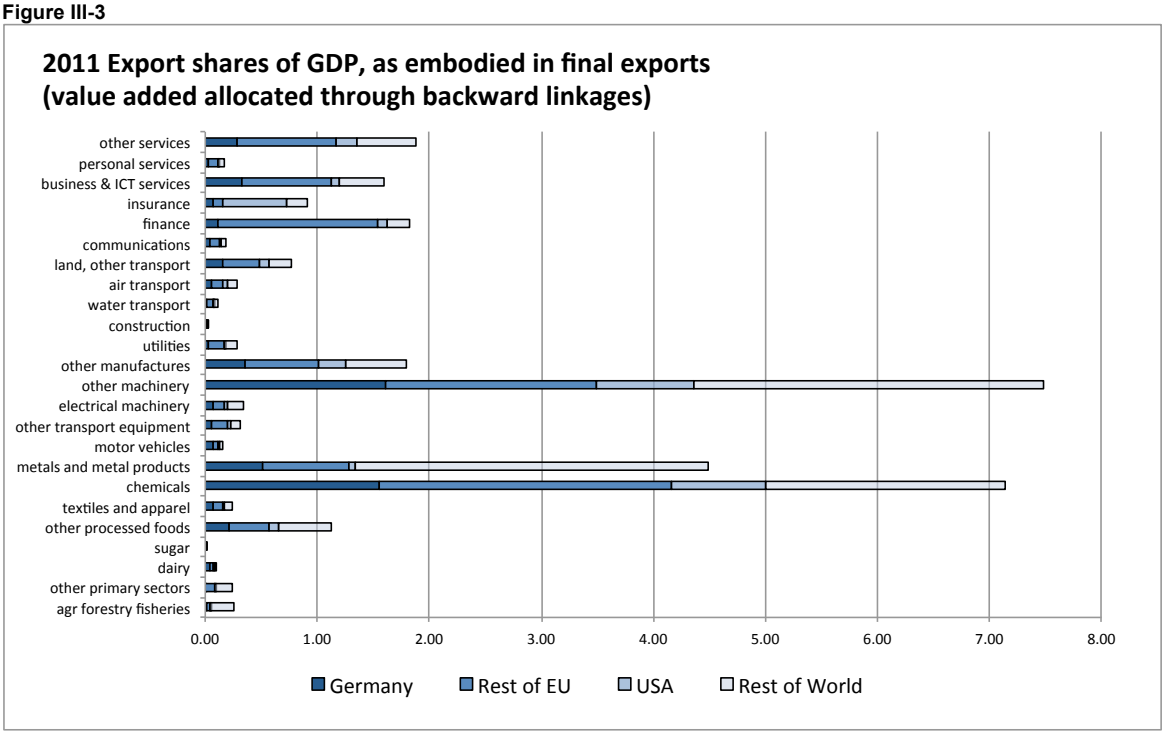
manufacturing is itself very service intensive. Roughly half of the value added contained in Swiss goods exports actually comes from service activities.

Figure III-2



Source: Own calculations from Gtap9.

Figure III-3



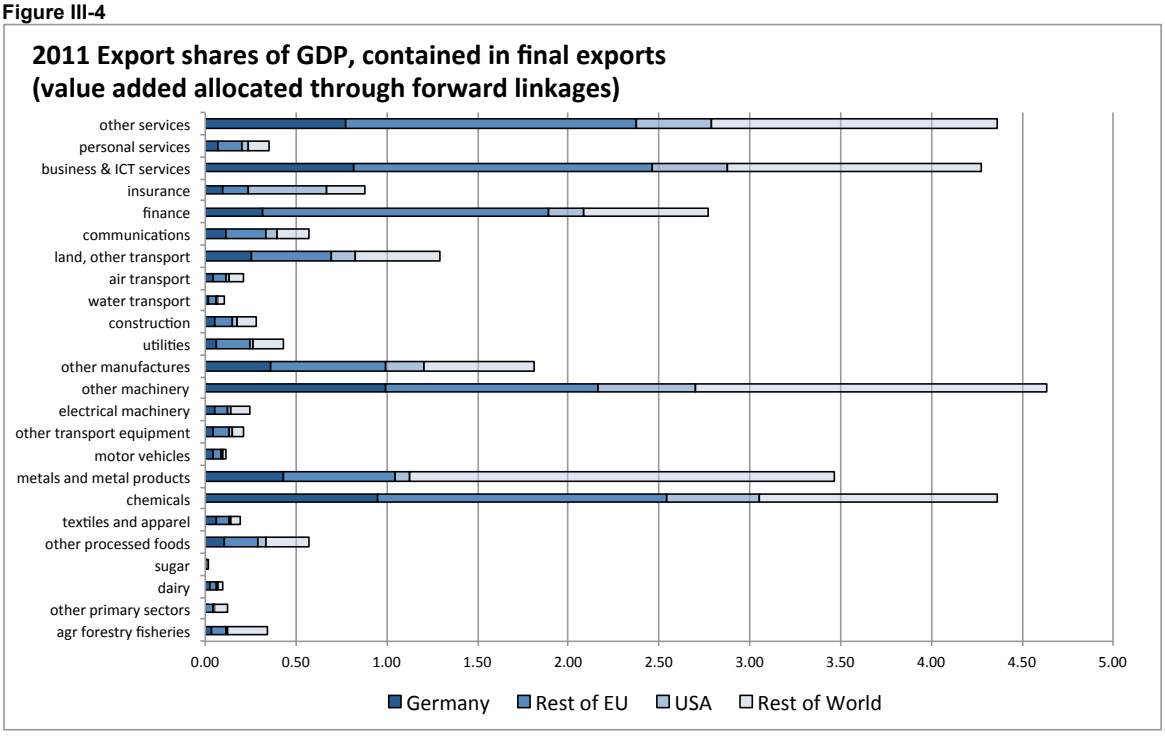
Source: GTAP9 and own calculations.

We provide a further breakdown on the relative importance of services to Swiss exports in Figures Figure III-3 and Figure III-4. Figure Figure III-3 is based on backward linkages. Three sectors stand out as particularly important – chemicals (including pharmaceuticals), metals and metal products, and other machinery. Both chemical and other machinery exports account for over 7 percent of GDP each (almost 15 percent of GDP combined). Services are important in a second tier, accounting collectively (as show already in Figure III-2) for 8 percent of GDP. Most important in terms of backward linkages are finance, insurance, business and ICT, and other services. Most of these exports are destined for the EU. Indeed, exports to Germany alone account for 5.69 percent of Swiss GDP.

Figure III-4 is based on forward linkages. This is informative because it sheds light on the service intensity of Swiss exports, in terms of activities that serve as inputs to those goods and services that are actually exported. Like Figure III-3, we again see machinery, metals and metal products, and chemicals as stand out sectors.

In contrast to Figure III-3, however, services are equally important. Stand out sectors include finance, business and ICT, and other services (which includes distribution services). Collectively, 16.87 percent of Swiss value added is exported to the EU. From Figure III-4, these exports are equally important for services and goods firms, even if the exports themselves are concentrated in goods. The combination of Figure III-3 and Figure III-4points to a strong interest in the service sector in Switzerland in market access conditions for goods exports.

Figure III-4



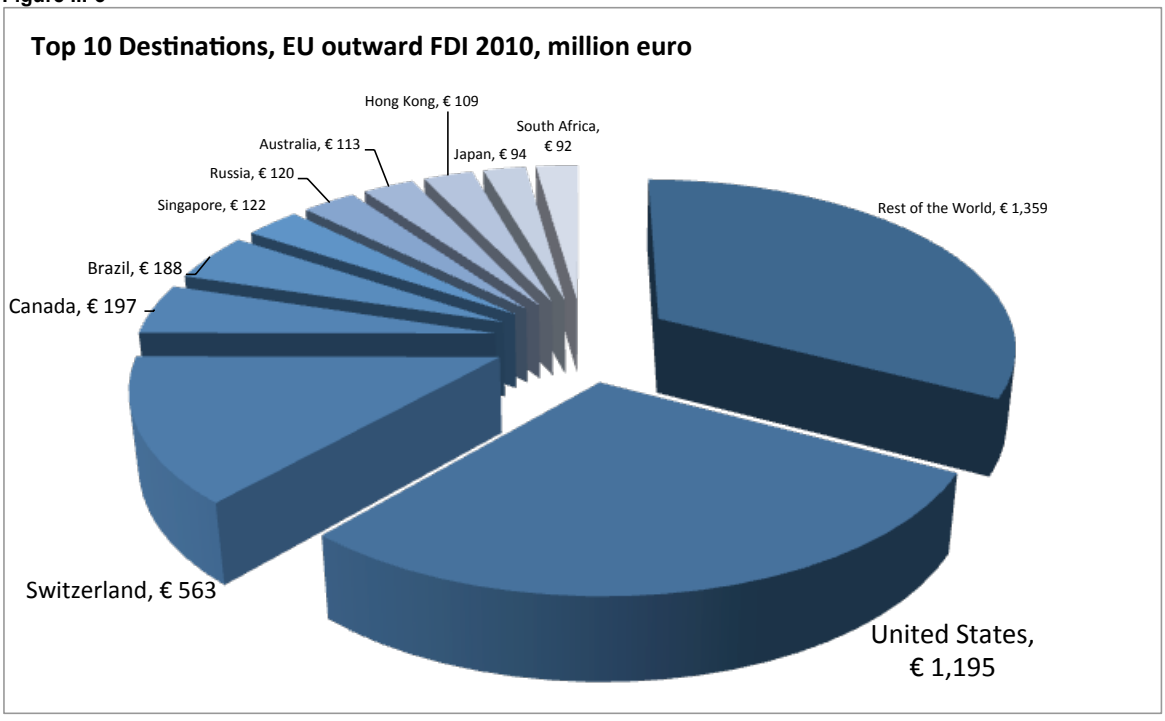
Source: GTAP9 and own calculations

Finally, in Figure III-5, Figure III-6, and Figure III-7 we focus on the Swiss FDI relationship with the EU. Switzerland is the second most important partner with the EU in terms of both inward and outward FDI, after the US.

At the same time, as can be seen on Figure III-7, the EU is the single most important host for Swiss FDI (42.7 percent) while US is the second most important host (18.8 percent) in 2012. Collectively, they account for over 60 percent of Swiss outward FDI.

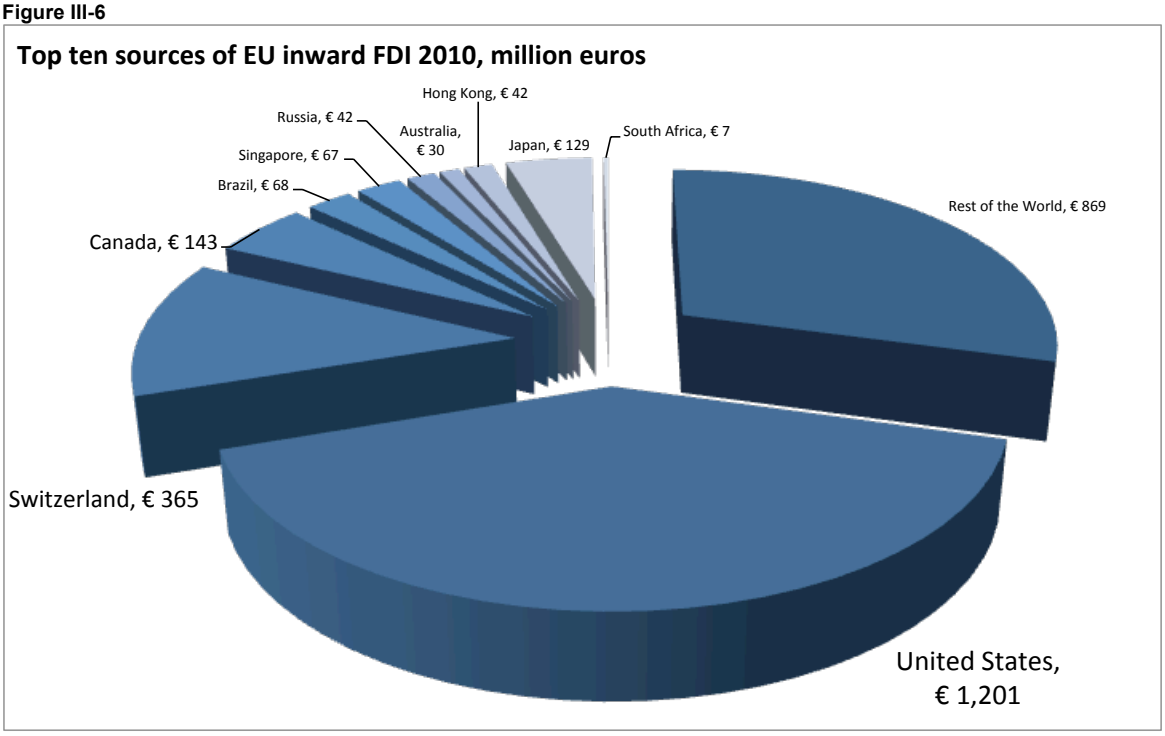
Given the deep FDI relationship between the EU and Switzerland, and the importance of the US as a host for Swiss FDI, greater access for US firms to the European market and for EU firms to the US market, there may be erosion of competitive positions for Swiss firms. To the extent Swiss firms operating in the US themselves gain better access to the EU, and Swiss firms in the EU gain better access to the US, then for Swiss firms operating abroad T-TIP might bring improved competitiveness for Swiss firms operating in those markets -- though not necessarily for those operating in Switzerland itself. For Swiss based firms, regulatory spillovers prove important.

Figure III-5[3]



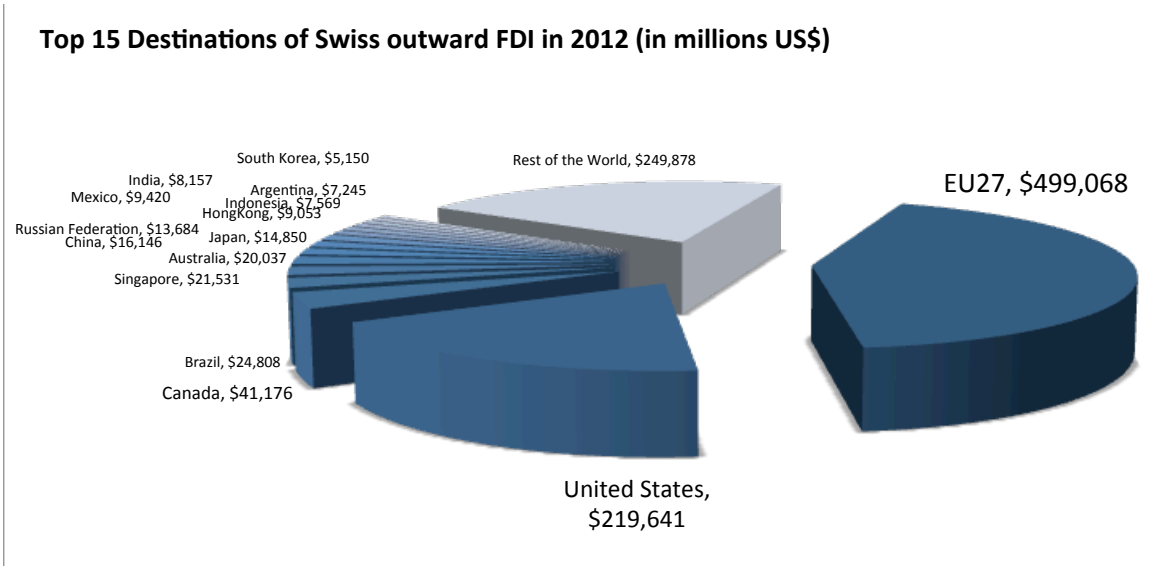
[3] 2010 was the latest available year for the data.

Figure III-6



source: EUROSTAT

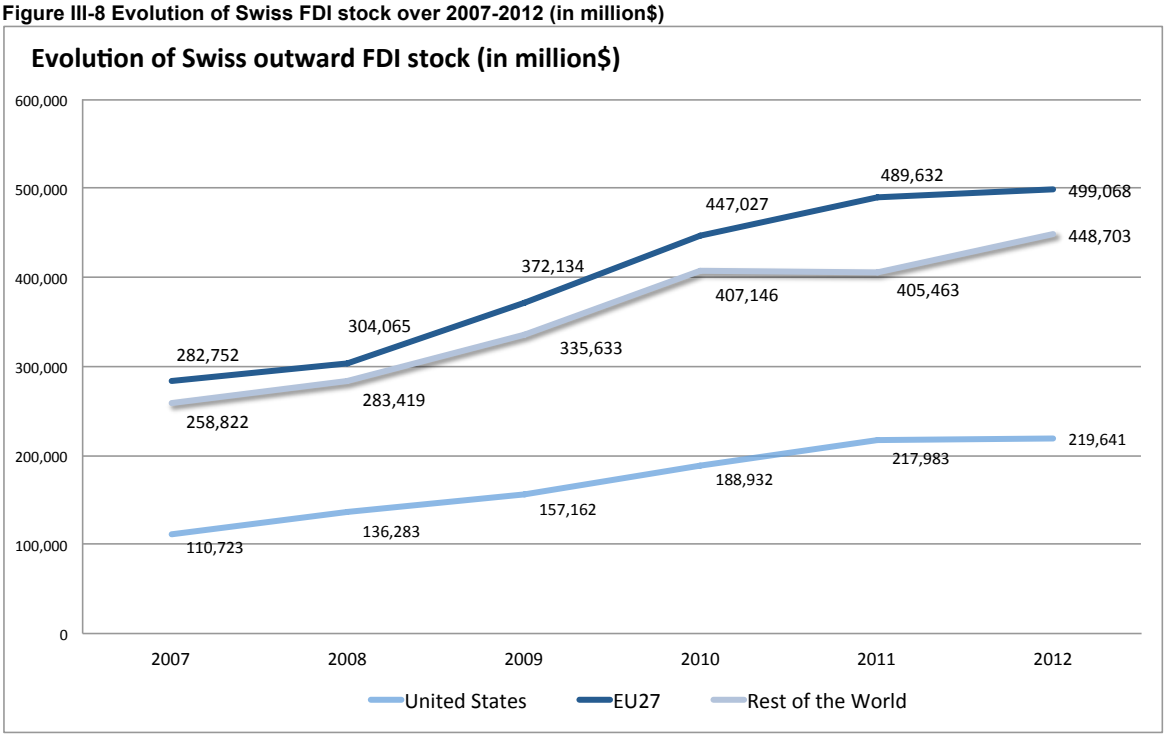
Figure III-7



Source: OECD

Figure III-8 depicts how outward Swiss FDI position has changed over the last years. FDI to the EU, with which Switzerland has lower barriers in both services and goods than with the EU, has increased over the period and more than twice as big than with the US. Nevertheless, Swiss FDI to the USA also increased over the period, from $110.7 billion dollars in 2007 to $219.6 billion in 2012.

Figure III-8 Evolution of Swiss FDI stock over 2007-2012 (in million$)



Source: OECD

B. NTBs and NTB Reduction: Actionability and Rents

Recent negotiations on trade agreements have been more focused on the importance of non-tariff barriers (NTBs) in addition to lowering tariffs than in the past. These are now a key component of trade agreements, and are likely to be increasingly important as we move forward. The reasons for this are as follows. First, with the multilateral, bilateral, and unilateral moves to reduce tariffs, what remains is by definition non-tariff barriers, which implies that they are getting more importance in a relative sense. Secondly, political processes that generate tariff protection of specific industries may turn to lobbying for NTBs as the scope for tariff protection is reduced. This would imply NTBS getting more important in an absolute sense. Finally, while not contributing to the rising importance of NTBs per se, significant progress in research in this area means we have a

better understanding of NTBs. This has contributed to a heightened awareness of barriers to trade.[4]

It should be stressed that in contrast to reducing tariffs, the removal of NTBs is not as straightforward. In fact, it is unlikely that all areas of regulatory divergence identified actually can be addressed. As previously pointed out, there are many different sources of NTBs and thus removing them may require constitutional changes, unrealistic legislative changes, or unrealistic technical changes. Removing NTBs may also be difficult politically, e.g. because there is a lack of sufficient economic benefit to support the effort; because the set of regulations is too broad; because of consumer preferences, language and geography; or due to other political sensitivities. In recognition of these difficulties, in the assumptions of the scenarios, the degree to which an NTB or regulatory divergence can, potentially and realistically, be reduced is taken into account which is discussed in more details in the following subchapter.

The literature estimating NTBs can be divided into two broad groups. The first involves overviews and assessments of available NTB measures and surveys of existing literature. This includes the OECD (2000) study on technical standards and conformity, OECD (2001) study on sanitary, phytosanitary and technical barriers to trade, the OECD (2005) study on customs fees and charges on imports, the OECD (2006) study on the review of different methods for assessing NTBs and the OECD (2009) study on NTBs affecting trade in agricultural and processed food products.

A second strand of this literature focuses on econometric estimates of non-tariff barriers. In this study we incorporate the econometric and survey results from recent EU-sponsored research on NTBs, building on the EU-US assessment by ECORYS (2009)[5] and CEPR (2013) and the G20 assessment by the OECD (2011). This relies on gravity-based econometrics, integrated with expert and firm surveys. The finished product of the EC-sponsored business and expert surveys generated bilateral NTB index numbers (between 0 and 100). Final NTB estimates are based on both gravity estimates and survey responses[6].

Figure III-9 presents the resulting estimates of total trade barriers (including both tariffs and NTBs) between the EU and the US from ECORYS (2009). The estimated ad-valorem barriers between the two regions are quite high, averaging between 22-% and 25% for

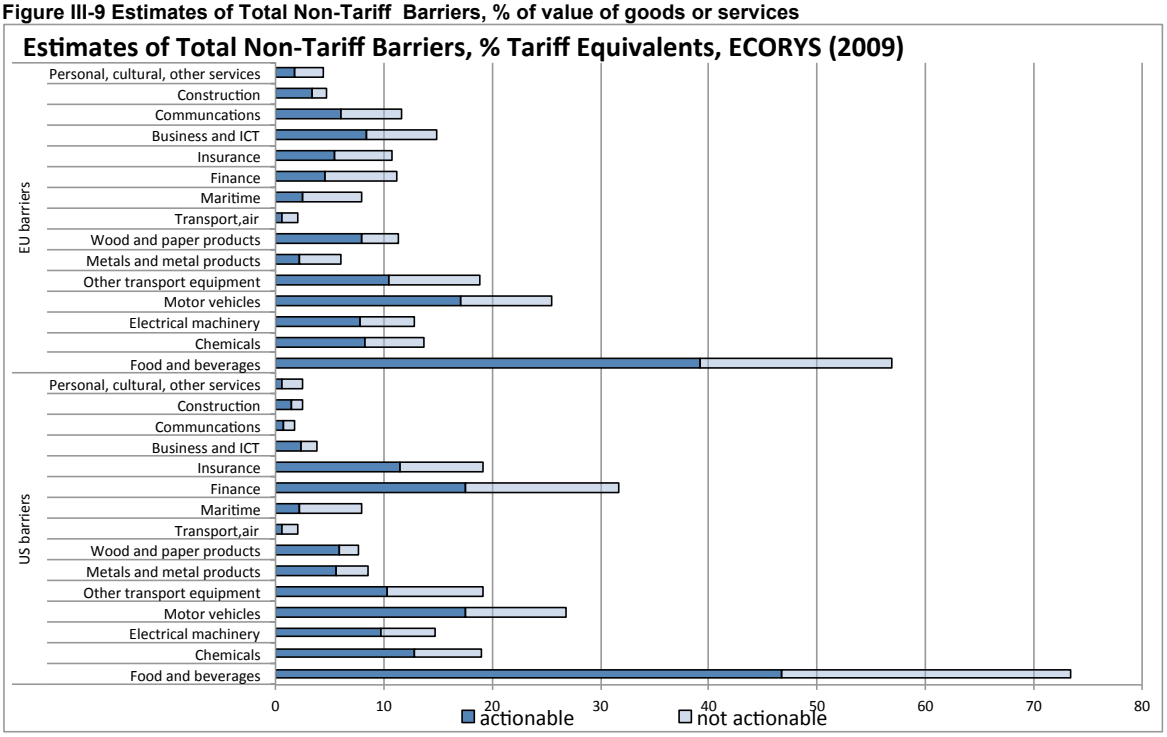
[4] For a survey on previous studies on NTBs in goods, see Anderson and van Wincoop, 2004. For services, see Francois and Hoekman, 2010.

[5] The study did not assume liberalization of agricultural sector given the political sensitivity of these products.

[6] These index number were transformed into "levels of trade restrictions", which in turn were used as inputs for gravity regressions. The coefficients emerging from the gravity equation estimates were then used to infer Trade cost equivalents (in ad valorem equivalent terms) resulting from current levels of NTBs (incorporating the Anderson, Bergstrand, Egger and Francois (2008) methodology). These were crosschecked against the OECD restrictiveness indicators and the Product Market Regulation (PMR) indexes (for goods) and the OECD (2007) FDI restrictiveness index (for services).

goods and around 9% for services. A question, which is highly relevant, is to what extent these barriers could be removed.

Figure III-9 Estimates of Total Non-Tariff Barriers, % of value of goods or services



To answer this question, the estimates of ECORYS (2009) reflect the feasibility of actually reducing apparent barriers. This reflects the concept of "actionability." The rationale behind the actionability approach is two-fold. First, most NTBs are based on domestic regulations that address certain market failures. In essence this implies that NTBs are put in place to assure that imported products comply with the same standards and regulations as domestic products. Trade costs, and trade frictions, thus arise from differences in regulations and their implementation. Obviously, 'reduction to zero' is not a feasible option for those NTBs, implying that a certain amount of trade costs related to those measures will always exist.

Some barriers actually follow from valid consumer protection measures for example, while historical and cultural factors may lead to legal and regulatory differences that are not easily changed. In other words, once NTBs are identified, we can subdivide these into those where negotiated reductions are feasible, and those where this is not feasible. The second is costs vs. rents. The result of the ECORYS (2009) breakdown along these lines is reported in Table III-1 Actionability and cost shares from ECORYS (2009). It is also reflected in the values shown in Figure III-9. From the table, on average roughly half of identified NTBs are actionable, or can actually be reduced through a process of bilateral negotiations.

Box: NTBs and the concepts of cost and rents

NTBs and regulatory differences can have two main effects. NTBs can either increase the cost of doing business for firms, or they can restrict market access. Traditional NTBs, like import quotas, are an example where NTBs restrict market access. In contrast, regulations that require expensive reconfiguration of products (like changing voltage or reconfiguration of an exhaust system) for export are an example of cost raising NTBs. Both can have different impacts by changing market concentration and economic power (and thus profits) of companies. In order to be able to make a distinction between those two types of NTBs, the concepts of 'cost' and 'rent' are included here in modelling of NTBs, following the findings of the firm surveys (and related literature) in the Ecorys (2009) study. That study found that about 60 per cent of the price impact of NTBs could be classified as following from actual cost increases on average, while the creation of market power (economic rent) was responsible for the other 40 per cent of price increases. This is an average, and there is some variation across both sectors and countries in this regard. In the case of NTB-related cost increases, this constitutes a welfare loss to society. In case of an increase in market concentration, consumer prices may also go up. However part of the increase is then appropriated by companies as they reap increased revenues and profits. Thus there is a redistribution of welfare, and not simply a reduction in economic efficiency.

The second breakdown inTable III-1 Actionability and cost shares from ECORYS (2009) is the share of total trade costs that actually raise costs, rather than generating rents. The welfare impact of NTBs can be quite different from those that follow from tariffs. First, tariffs are collected as revenue, and do not involve substantial increases in actual cost of production and delivery. With NTBs, these can instead reflect real increases in cost of production and delivery. For example, in the ECORYS (2009) and Copenhagen (2009) studies, on average around 55 percent to 60 percent of the price impact of NTBs was linked to increased operational costs of firms serving foreign markets. The remainder was linked to higher price because of rents generated by restricted competition in the affected markets. In terms of welfare calculus, this means that a substantial portion of the price effect of NTBs (roughly half) is pure dead weight loss linked to higher costs. This in turn implies potentially large welfare effects relative to a comparable tariff barrier.[7]

In general, cost-raising trade barriers imply direct, and significant, gains from trade liberalization relative to comparable tariffs (where comparable is defined in terms of price impacts.) Their allocation depends, like terms of trade effects, on relative supply and demand elasticities. Regardless of their national allocation, however, global welfare ef-

[7] Winchester (2009) reaches a similar conclusion about NTBs vs. tariffs for a single country case. Also see Francois and Wignarajan (2008) and Kitwiwattanachai et al (2010) on the case of Asian regional integration.

fects will be bigger. For the purpose of this study, we have focused on a partial reduction of NTBs (50%) and have modelled them as involving trade costs and rents.

Table III-1 Actionability and cost shares from ECORYS (2009)

Sector	Potential barrier reduction, actionable (%)		Cost shares of NTBs	
	US barriers	**EU barriers**	**US barriers**	**EU barriers**
Aerospace	51	59	54	56
Automobile	69	67	65	67
Chemicals	57	63	67	61
Communication	66	70	41	52
Electronics	63	64	64	65
Cosmetics	52	58	66	73
Financial	55	49	56	41
Insurance	48	52	60	50
Food & beverages	51	53	64	69
Office equipment	51	52	68	58
Pharmaceuticals	47	42	60	68
Transport	59	56	27	32
Biotechnology	42	41	66	35
ICT	43	35	86	55
Construction	57	38	57	72
Machinery	49	55	54	61
Medical	42	45	65	54
Other business services	49	51	37	59
Personal, recreational services	47	37	24	39
Steel	50	62	66	36
Textiles	54	50	76	68
Wood	61	60	77	70
Travel services	48	40	75	55
Average	**53**	**52**	60	56

Source ECORYS(2009). List of corresponding sectors to more detailed GTAP sectors and ISIC sectors is provided in the Appendix.

C. General Equilibrium Assessment

In order to make an economic assessment of the impact of the TTIP on Switzerland, we employ a CGE model of global world production and trade matrix. CGE models help answering *what-if* questions by simulating the price, income and substitution effects in equilibrium on markets under different assumptions. Here, the economic outcomes of the "baseline" scenario, with no policy effects, are compared to the different scenarios with changes in trade policy. The “baseline” for the model is the equilibrium before the policy change, and the ‘scenario’ is the equilibrium after the policy change. The effect of the policy change can then be quantified as the difference between the two.

We start with a short discussion on the computable general equilibrium model (CGE) model applied in the analysis, while more details are available in the Annex. The discussion of the model is followed by discussion of experiment design and results (estimates of impacts on Switzerland).

1. The CGE Model

The CGE model we work with is based on the widely used GTAP model (Hertel, 1997), with added features from the Francois, van Meijl, and van Tongeren (2005) model. More technical details of the model are provided in the annex. The most important aspects of the model can be summarized as follows:

- It covers global world trade and production;
- It allows for scale economies and imperfect competition;
- It includes intermediate linkages between sectors;
- It allows for trade to impact on capital stocks through investment effects; yielding longer-run economic impacts.

In the model, there is a single representative composite household in each region, with expenditures allocated over personal consumption and savings. The composite household owns endowments of the factors of production and receives income by selling these factors to firms. It also receives income from tariff revenue and rents accruing from import/export quota licenses. Part of the income is distributed as subsidy payments to some sectors, primarily in agriculture.

Taxes are included at several levels in the modelling. Production taxes are placed on intermediate or primary inputs, or on output. Tariffs are levied at the border. Additional internal taxes are placed on domestic or imported intermediate inputs, and may be applied at differential rates that discriminate against imports. Where relevant, taxes are also placed on exports, and on primary factor income. Finally, where relevant (as indi-

cated by social accounting data) taxes are placed on final consumption, and can be applied differentially to consumption of domestic and imported goods.

On the production side, in all sectors, firms employ domestic production factors (capital, labour and land) and intermediate inputs from domestic and foreign sources to produce outputs in the most cost-efficient way that technology allow. Perfect competition is assumed in all sectors except heavy manufacturing sectors. In sectors where perfect competition is assumed, products from different regions are assumed to be imperfect substitutes.

Heavy manufacturing sectors, as well as business services, are modelled with imperfect or monopolistic competition. Monopolistic competition involves scale economies that are internal to each firm, depending on its own production level. An important property of the monopolistic competition model is that increased specialisation at intermediate stages of production yields returns due to specialisation, where the sector as a whole becomes more productive the broader the range of specialised inputs. These gains spill over through two-way trade in specialised intermediate goods. With these 'spill-overs', trade liberalisation can lead to global scale effects related to specialisation. Similar gains follow from consumer good specialisation.

In the standard GTAP model, tariffs and tariff revenues are explicit in the GTAP database, and therefore in the core model. However, NTBs affecting goods and services trade, as well as cost savings linked to trade facilitation, are not explicit in the database and hence a technical coefficient must be introduced to capture these effects. For this, we instead model NTBs as a mix of dead weight or iceberg costs[8], and rents generated by NTBs. In formal terms, dead-weights costs capture the impact of non-tariff measures on the price of imports from a particular exporter due to destination-specific changes in costs for production and delivery.

Our social accounts data are based on the most recent GTAP (GTAP9) dataset. The GTAP data are benchmarked to the year 2011[9], but we then project the data to 2030 based on the medium baseline or SSP2 (Shared Socioeconomic Pathway) from the most recent SSPs and related Integrated Assessment scenarios used for climate modelling (IAASA 2012, O'Neill et al 2012). Tariffs reflect the most recent applied rates, as discussed above. We also implement the recent FTAs (EU-Korea, US-Korea, Central America, MERCOSUR, and US-Central America) onto the 2030 baseline. While the GTAP database has 57 sectors and 138 different regions are available, for the purpose of this study we have aggregated sectors and regions to allow us to concentrate on the key results. (See Table III-2 for a list of regions and growth rates, and Table III-3 for a list of sectors covered by the CGE model).

[8] We follow the standard approach to modelling iceberg or dead-weight trade costs in the GTAP framework (Francois 1999, 2001; Hertel, Walmsley and Itakura 2001). It has featured in the joint EC-Canadian government study on an EU-Canada FTA, as well as the 2009 ECORYS and 2012 2013 studies on EU-US non-tariff barriers.

[9] For both partial and general equilibrium analysis we use the latest year available.

Table III-2 Regions used in the model.

Region			GDP growth, annual % 2011-2030
1	e27	European Union (27 members)	1.91
2	deu	Germany	1.38
3	usa	United States	2.88
4	che	Switzerland	2.31
5	eft	Other EEA	2.85
6	eur	East Europe and Russia	5.02
7	med	Mediterranean countries	4.62
8	tpp	TPP countries	3.96
9	chn	China	7.80
10	jpn	Japan	0.65
11	oas	Other Asia	5.99
12	lin	Low income countries	6.81
13	row	Rest of world	4.52

Source: OECD/IIASA SSP2 (baseline) GDP projections.

Table III-3 Model Sectors

no & acronym		description
1	aff	Agriculture, forestry, and fisheries
2	ops	Other primary sectors
3	dry	Dairy
4	sug	Sugar
5	prf	Other processed foods
6	tap	Textiles and apparel
7	chm	Chemicals
8	mtl	Metals and metal products
9	mvh	Motor vehicles
10	otn	Other transport equipment
11	elm	Electrical machinery
12	omc	Other machinery
13	omg	Other manufactures
14	utl	Utilities
15	cns	Construction
16	wtp	Water transport
17	atp	Air transport
18	otp	Land, other transport
19	cmn	Communications
20	fin	Finance
21	ins	Insurance
22	bus	Business services
23	ros	Personal services
24	osv	Other services

Table III-4 below summarises underlying trade barriers used in the modelling. Here, we present the current MFN tariffs rates, and also estimates of "actionable NTBS" meaning potential trade cost reductions linked to NTBs. As discussed in the previous section on the policy landscape, official data on the levels of NTBs in place are not readily available, nor are there any absolute measures on how much of them could or should be removed. The amounts in the table represent the assessment, based on a mix of econometric and expert assessment and firm interviews, of the costs that are potentially addressable through negotiation. These potential reductions serve as the basis for the experiments that follow. There are some sectors where no major actionable barriers outside tariffs were identified, and others not identified as priority areas for negotiation.

Table III-4 Underlying applied (MFN) tariff rates and NTBS

	Tariffs, Ad valorem (% of value of trade)			ECORYS (2009) AVEs estimates of actionable NTBs, Ad valorem equivalents (% of value of trade)	
	EU	US	CH	EU	US
Agr forestry fisheries	3.55	3.59	8.28	*	*
Other primary sectors	0.00	0.02	0.15	*	*
Dairy	37.96	18.54	52.19	39.2††	46.7††
Sugar	11.41	13.94	4.88	39.2††	46.7††
Other Processed foods	13.24	2.07	30.12	39.2††	46.7††
Textiles & clothing	7.64	8.05	5.52	†	†
Chemicals	2.08	1.12	0.27	8.3	12.8
Metals	1.60	1.27	0.26	2.2	5.6
Motor vehicles	8.03	1.18	0.87	17.2	17.5
Other transport equipment	1.27	0.12	0.24	10.5	10.4
Electrical machinery	0.55	0.28	0.06	7.8	9.7
Other machinery	1.22	0.81	0.24	†	†
Other manufactures	1.52	1.73	0.32	†	†
Utilities				*	*
Construction				3.3	1.4
Water transport				4.5	5.2
Air transport				1.1	1.3
Land, other transport				4.5	5.2
Communications				8.2	1.3
Finance				4.6	17.6
Insurance				5.4	11.5
Business services				8.5	2.4
Personal services				1.7	0.6
Other (public) services				*	*

Source: GTAP 9 and WTO, CEPII, UNCTAD as mapped to GTAP 9.

† While the ECORYS study covered all machinery and equipment, no significant barriers were identified apart from motor vehicles, other transport equipment, and electrical machinery. At the same time "other manufactures" include a diverse basket of products not covered in the original study.

†† ECORYS covered a basket of "all processed foods and beverages" which has been applied here to sugar, dairy, and all other processed foods and beverages.

* Not covered by the ECORYS estimates. Other services include education, health care, and public administration services. A list of correspondence between modelling sectors and ISIC sectors is included in the Annex.

As can be seen from the first two columns, the MFN tariffs are much higher for processed food products than for other goods. Within manufacturing, motor vehicles are heavily protected by tariffs in the EU, while textiles and clothing are heavily protected in both relative to average tariff levels.

The ECORYS (2009) estimates of actionable NTBS -as percentage trade costs- are consistently higher than MFN tariff rates. Some sectors have higher NTBs in the EU than in the US, and vice versa. Two sectors in particular exhibit the highest levels of NTBs for both economies: processed foods and motor vehicles.

Comparison to other estimates

The model we work with here is a multi-sector CGE model, which contrasts with recent studies using alternative approaches to structural modelling. (See for example Felbermayr et al 2013). While both sets of models are structural, with parameters based on a mix of econometric estimates (for example econometrically estimated trade elasticities), and with constant elasticity of substitution (CES) based trade, there are differences, including the extent to which one fits data to the model vs. fitting the model to the data. A review of these differences can be found in Pelkmans et al (2014). Not all differences are important to resulting estimates. One difference that is important is the underling estimates of trade costs, and how these are treated in policy experiments. While we treat NTBs as involving a mix of cost and rent generating barriers, some recent studies treat all NTBs as cost generating. Based on the actual split in barrier types from firm and regulatory survey data, it is our view that this would tend to overstate the impact of given NTB reductions by roughly 40 percent to 50 percent compared to a model where these are split between costs and rents. Another difference is that we also focus on actionability, meaning we limit estimated NTB reductions to those that are viewed as candidates for reduction through negotiation. Based again on the actual split in barrier types from firm and regulatory survey data, this time between actionable and not actionable, ignoring this (assuming all identified NTBs are actionable) would tend to overstate the impact of NTB reductions by roughly 50 percent. Finally, while we model services trade and liberalization (services are typically 70 percent of GDP in OECD countries) this is not included in all recent studies. As services are less tradable, though the sectors themselves are relatively open in the EU and US both, this again implies potential to overestimate the level of barriers (more of GDP is less tradable for natural reasons) and to overestimate the impact of liberalization. These differences in approach mean that substantial differences in findings may be encountered when comparing estimates across studies.

2. Scenarios

We next turn to the scenarios assumed for the CGE model applied in the analysis. The experiments are set up around a baseline and stylised modelling scenarios. The purpose of the baseline is to examine the impact of the FTA relative to the expected position of the economy if the policy was not implemented.

Contrasting to the idea of removing tariffs, it is not realistic to assume that all NTBs can be removed due to the underlying differences in the nature of these measures. As a result, when modelling the liberalisation of NTBs, we take into account the degree to which explicit NTBs or trade costs from regulatory divergence can realistically be reduced (via various means and techniques). Following ECORYS (2009), approximately 50 per cent of all NTBs indeed are removable (actionable). The approximation is based on expert opinions, crosschecks with regulators, legislators and businesses supported by the business survey from the ECORYS (2009) study. Nevertheless, this estimate should be seen as a very rough estimate and thus should be interpreted with some caution.

The estimates reported below are set up around three basic scenarios, differing with respect to the levels of ambition with regards to liberalisation: modest tariffs only; modest tariffs and modest NTB liberalization; and modest tariff and ambitious NTB liberalization. The definition of "modest" and "ambitious" follows the EC assessment (ECORYS 2013), meaning 20 percent and 50 percent of actionable NTBs (see Table III.5) respectively. "Modest tariffs" means that roughly half of potential tariff reductions are realized in food products,[10] but 100 percent in all other sectors. This results in of 98 per cent overall tariff removal. In addition the modest scenario assumes a reduction of actionable NTBs of 20 per cent on a preferential basis. The ambitious NTB scenario assumes a 50 per cent overall reduction of actionable NTBs. Here, in the ambitious NTB scenario, we also assume these extend on a limited basis to third countries (NTB spillovers). In particular, we assume that with regulatory convergence, this results in a partial benefit for third countries as well, and the two regimes would become more similar. This is modelled as 20% of the bilateral NTB reduction. We discuss spillovers separately.

The modelling scenarios are summarised in Table III-5 below. Critically, we include subexperiments as well, reflecting the options for Switzerland to also pursue an agreement with the US.

[10] This assumption follows from extensive discussions between policy makers and sectoral experts.

Table III-5 Overview Scenario Definitions

Scenario/ Liberalisation Measures	Swiss response	Spillovers
I. Tariffs only	1 No FTA EFTA-US	Without spillovers
	2 With FTA EFTA-US	Without spillovers
II. Tariffs and modest NTBs	3 No FTA EFTA-US	Without spillovers
	4With FTA EFTA-US (tariffs and NTBs)	Without spillovers
	5 Swiss-US Agreement only on NTBs	Without spillovers
III. Tariffs and ambitious NTBs	6 No FTA EFTA-US,	With 20% spillovers
	7 With FTA EFTA-US (tariffs and NTBs)	With 20% spillovers
	8 With FTA EFTA-US (tariffs and NTBs)	-With 20% spillovers

Summary of tariff and NTB reductions under the different scenarios

Scenario/ Liberalisation Measures	Tariff Removal	Reduction of NTBs
Modest scenario	100%, except limited reductions for food products	20 % of actionable NTBs
Ambitious scenario	100%	50 % of actionable NTBs

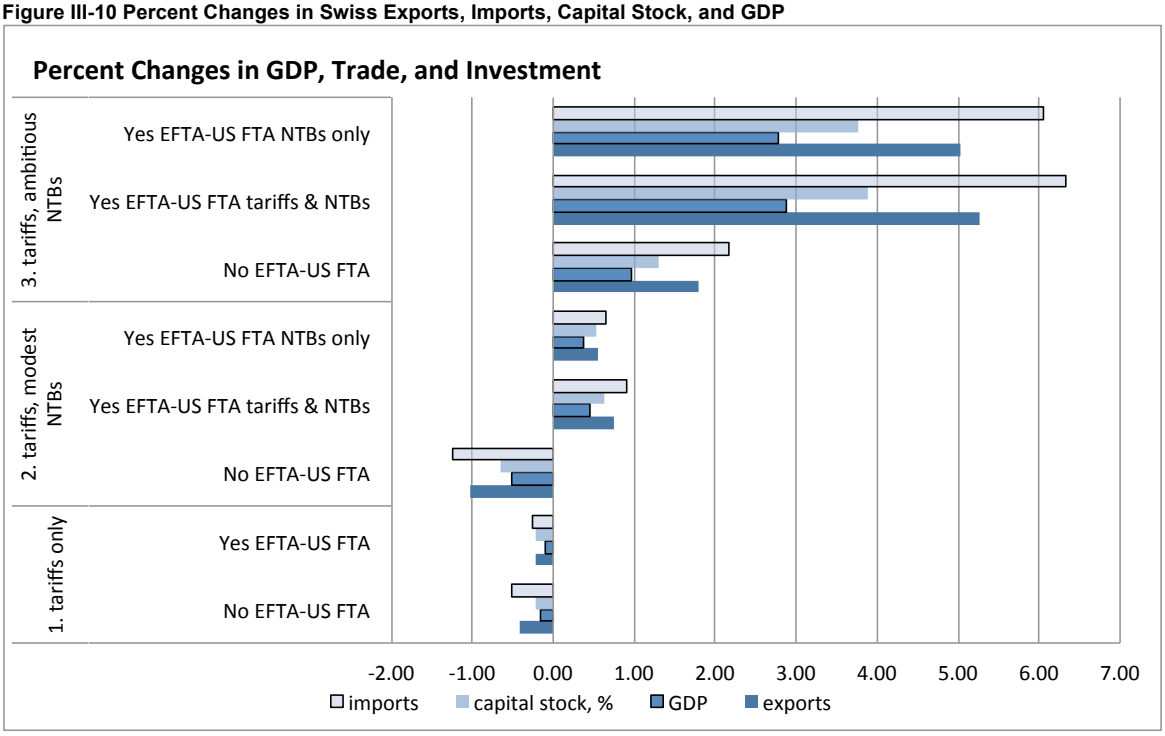
Policy changes in general, and the lowering of NTBs in particular, will take time to implement and take effect. To allow time for these changes, the baseline has been projected into 2030. In order to take this into account in the modelling, the Swiss economy, the EU and the US economies have been projected to grow. The projections reflect IMF data (inclusive of the Great Recession) through 2015, and SSP projections from that point. As such they reflect expected impact and recovery from the recession.

3. Macroeconomic Results

Figure III-10 through Figure III-13 below presents a summary of the macroeconomic impact of TTIP on the Swiss economy. These represent estimates of changes in the Swiss economy in the projection year 2030. In other words, instead of presenting the results for the baseline year 2011, since it is likely that the agreement will only be fully implemented in the future, we use the 2030 to present results. In addition, we also assume that the agreement is fully implemented, and investment levels and capital stocks have had time to adjust to the new policy environment. This means not only that capital has

been reallocated across sectors (sector level capital stocks) but also that total capital stocks have adjusted as well.

Figure III-10 Percent Changes in Swiss Exports, Imports, Capital Stock, and GDP

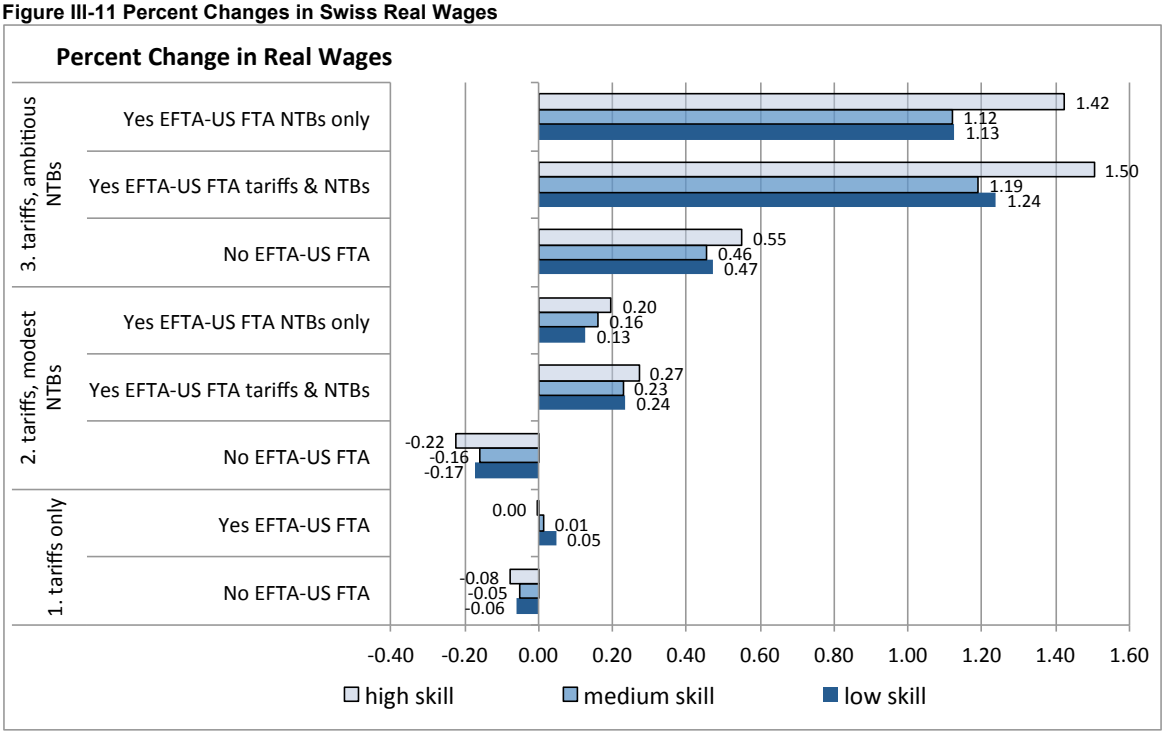


Source: CGE model estimates

At the macroeconomic level, all scenarios identify a likely negative impact on Switzerland in the absence of a Swiss response and/or spillovers. In Scenario 1, we see a potential loss of 0.4 percent of GDP, while both exports fall by around 0.2 percent and imports fall by 0.5 percent with a tariff only agreement in case of no Swiss response (No EFTA-US FTA).

Under the deeper scenarios, there is an even greater contrast between an active and passive EFTA response. With the modest agreement, for example, the impact on Swiss GDP ranges between -1.03 and +0.46 percent (with a corresponding $4 billion loss and $3.6 gain each year depending on whether or not there is an EFTA response in the form of an agreement with the US. In the ambitious case, this ranges between +0.96 with a passive response and +2.87 percent of Swiss GDP ($7.5 billion vs. $22.6 billion gain). Clearly, the nature of the policy response to challenges of T-TIP is critical (is there an EFTA initiative or not?).

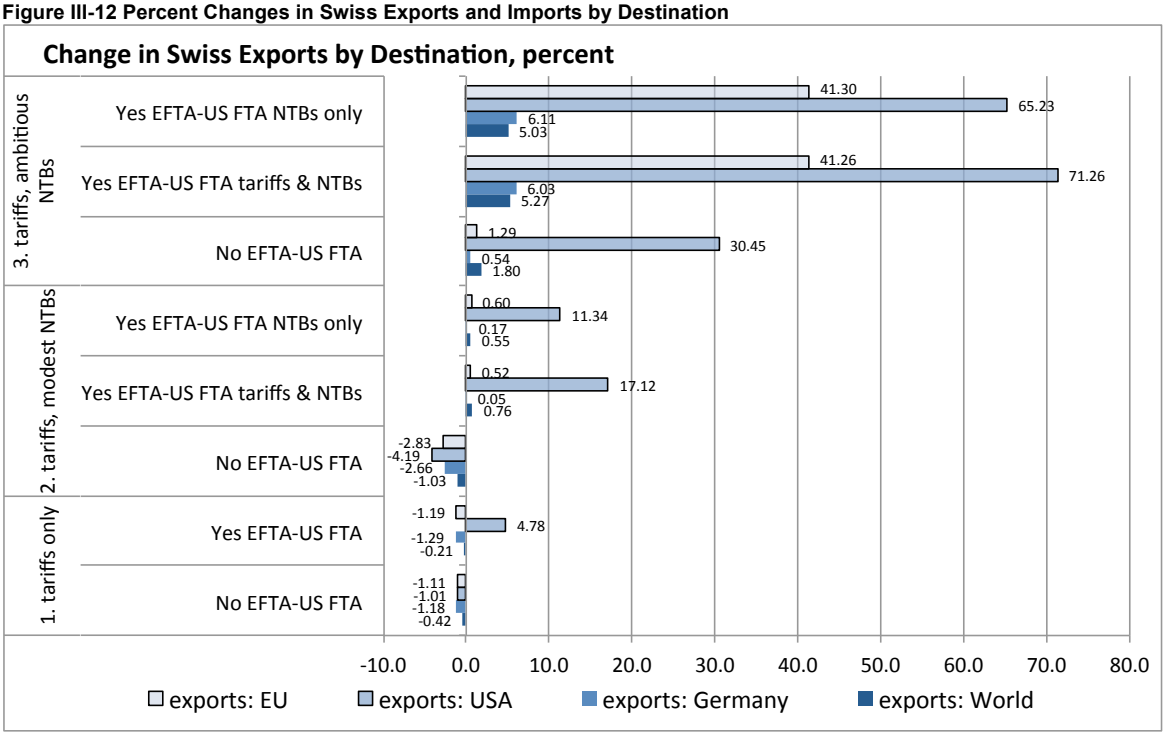
Figure III-11 Percent Changes in Swiss Real Wages

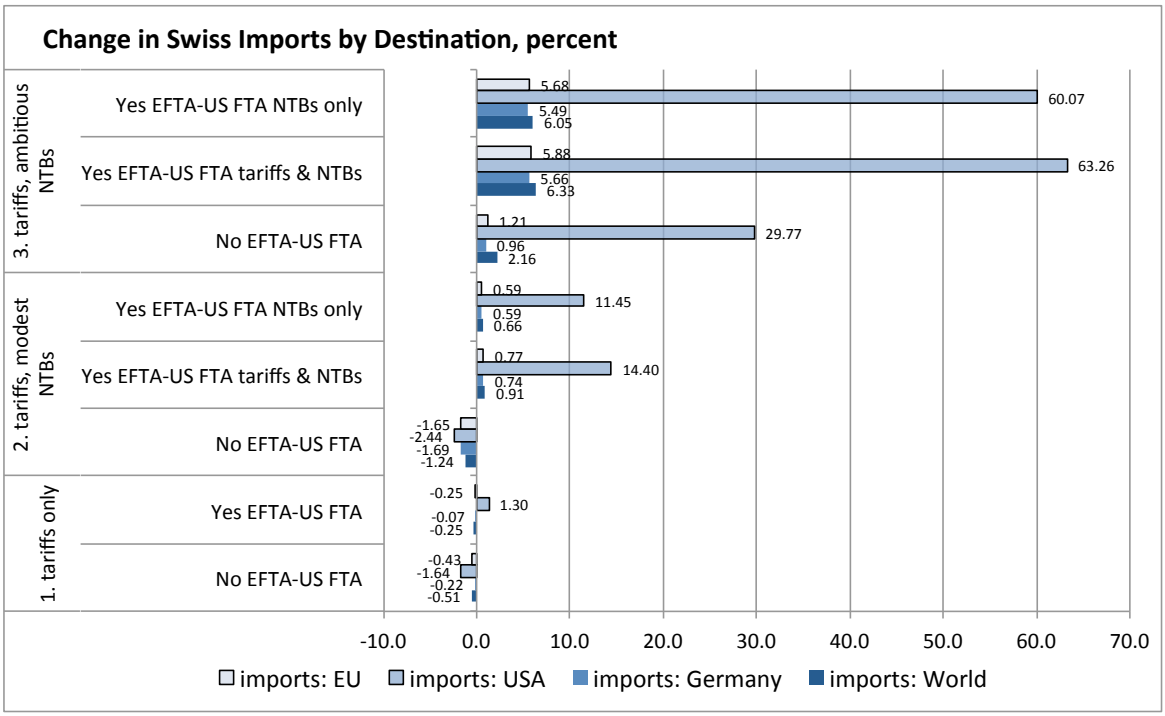


Source: CGE model estimates

Under the different scenarios, real wages of high, medium, and low skill workers move in the same direction, with high skilled workers being slightly more affected. Although there is only small difference in the impact between different skill groups, the higher impact on skill workers reflects the underlying comparative advantage of the Swiss economy being more on high skilled categories. Thus in case of no EFTA/Swiss policy response, some of those sectors experience competitive pressure from US importers with reduced barriers after the agreement, thus resulting in some trade diversion and pressure on those sectors reducing somewhat demand for workers, for high skill workers relatively more. Similarly to GDP effects, real wages would decrease, although only slightly, with shallow T-TIP agreements. There are gains under a deep T-TIP whether there is also an EFTA-US agreement or not, but in the deep scenario, the benefits of a flanking agreement between EFTA and the US are the greatest across the scenarios examined. Primarily, this follows from the NTB aspects of an EFTA-US deal, and not from tariffs so much (compare the last two sets of experiment 3 results).

Figure III-12 Percent Changes in Swiss Exports and Imports by Destination

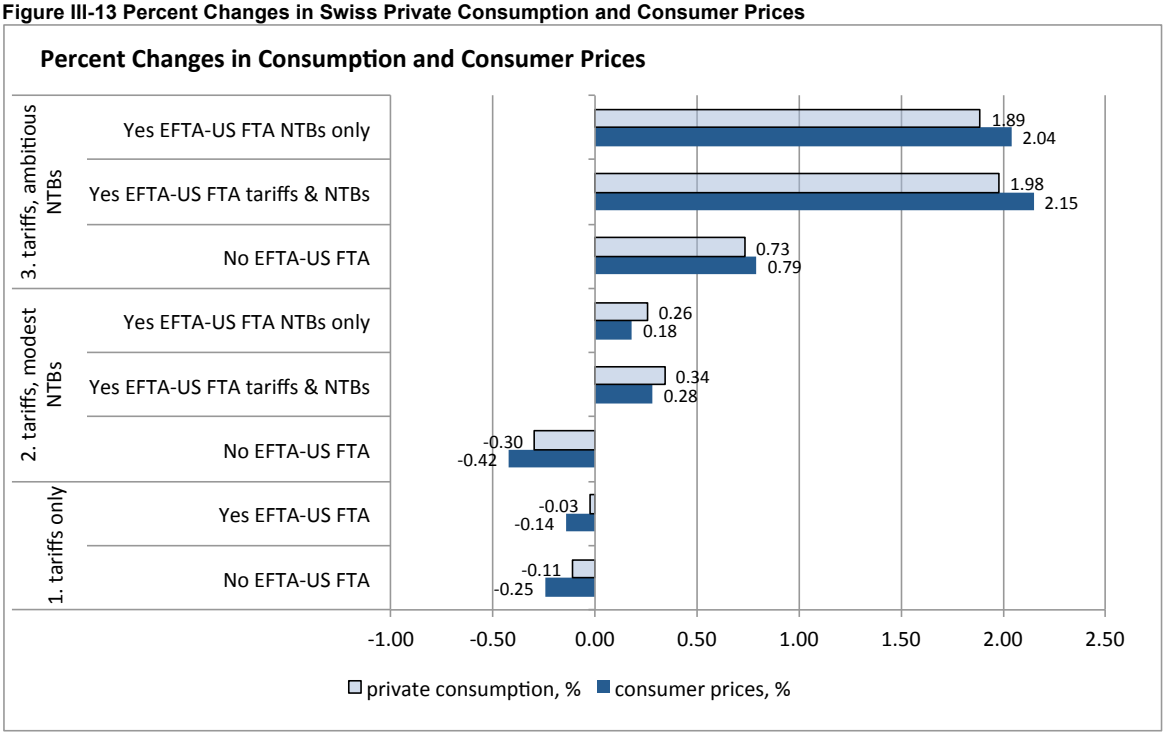




Source: CGE model estimates

In case of no EFTA-US agreement, under the shallow scenarios trade diversion results in lower Swiss exports and imports to the USA and EU. In the most ambitious scenario, Swiss exports to the US would expand because of spillovers (something we focus on in the next section), even without an EFTA-US agreement. On the other hand, if there is such a flanking agreement, there is a quite significant increase in both imports from and exports to the US, but also to the EU (though not so much to Germany).

Figure III-13 Percent Changes in Swiss Private Consumption and Consumer Prices



Source: CGE model estimates

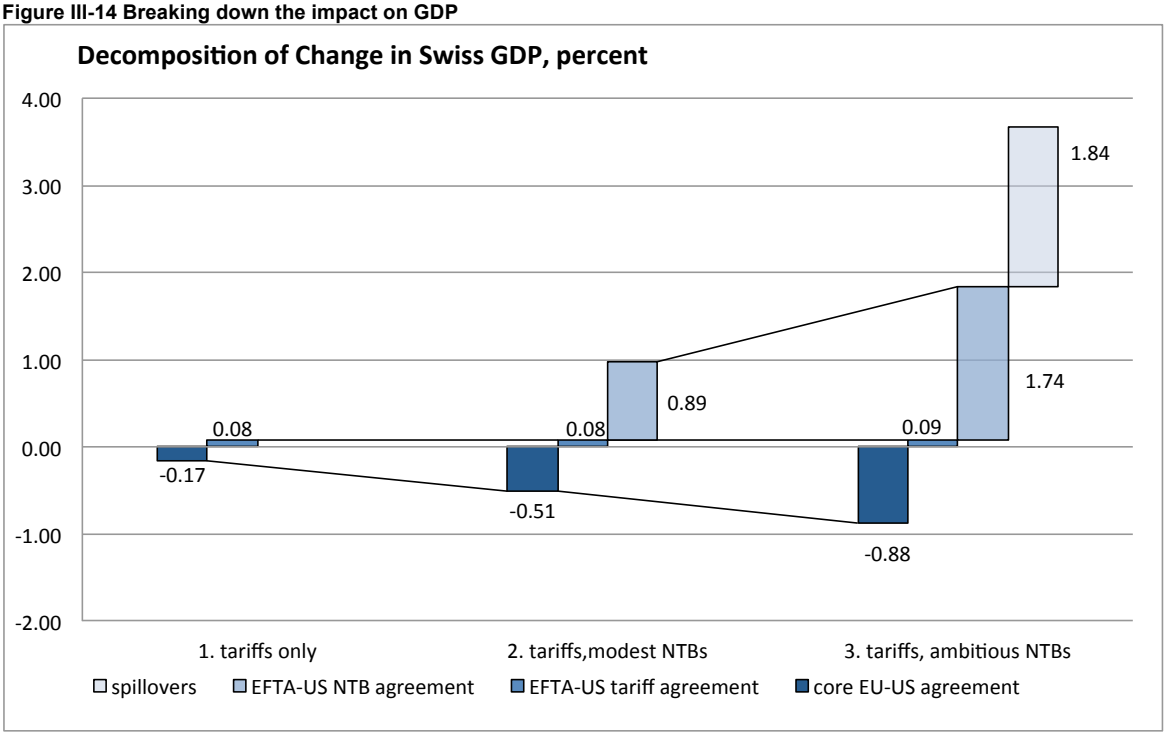
Changes in private consumption and consumer prices broadly correspond to trends in GDP changes. In case of a shallow T-TIP and no flanking EFTA-US, as the economy contracts slightly consumer demand also declines slightly, resulting in lowering consumer prices. On the other hand, with an EFTA-EU agreement (Scenarios 2and 3), regulatory convergence spillovers (Scenario 3), real household consumption increases. In the case of the most ambitious scenario, combined with an EFTA-US agreement, real household consumption increases by almost 2 percent

4. Understanding the Results

As noted above, in specifying the most ambitious scenario (scenario 3), we also allow for some element of spillovers with NTB liberalization. In this case, we then have reductions in market access costs (NTB reductions) extending on a limited basis to third countries, including Switzerland. Given the size of the EU and US markets, such spillover effects can be substantial. We have illustrated this point in Figure III-14 below, where we

have broken down estimated changes in Swiss GDP into the driver of those changes. What we find is that regulatory convergence spillovers are central to the overall estimated impact of TTIP on Switzerland. Without this MFN element added to what is otherwise a preferential exercise, the impact on Switzerland is quite different. What can be seen from Figure III-14 is that, lacking such spillovers, the deeper the core EU-US agreement in T-TIP, the greater the costs to Switzerland. Indeed, for a purely discriminatory bilateral agreement, the costs range from -0.17 percent of GDP to -0.88 percent of GDP for Switzerland. However, it is also clear than a comparable EFTA-US agreement is more than enough to offset the direct discriminatory costs. Under the most ambitious scenario, even without spillovers, an EFTA-US agreement is worth 1.74 percent of GDP for Switzerland, and turns an otherwise negative outcome into a combined gain of 1.04 percent of GDP excluding spillovers. When we also include spillovers, we arrive at a total net effect adding the columns together under experiment 3) of 2.87 percent of GDP. This illustrates the importance both of the core EU-US agreement (potentially quite negative), the benefits of a flanking agreement such as an EFTA-US agreement (potentially quite positive) and also the further benefits of regulatory streamlining (substantial gains form spillovers).

Figure III-14 Breaking down the impact on GDP



It must be stressed that estimated spillovers are highly speculative, even more so than standard trade policy modelling. The reason is that, unlike old-style FTAs, the TTIP ne-

gotiations are different in that they offer scope for reducing unintended barriers in a way that might lead to standards adoption by third countries. Indeed, in the CEPR (2013) study, the possibility of falling trade costs between third countries is also explored. The extent to which third countries then adopt a standard adopted by both the US and the EU, accounting together for a major share of world production and trade, is not something anticipated with old-style FTAs. As such, apart from the single market process in the EU itself, we have little basis for gauging how large these effects might be. Thus Figure III-14 presents possible effects, but rely on what is an unknown extent to which we will have regulatory spill-overs and convergence, more or less unintentionally, with third countries.

We turn next to the impact of TTIP on the structure of the Swiss economy. The broad pattern of estimated effects is summarized in Figure III-15 and Figure III-16. A consistent message in both figures is that the impact depends critically on whether or not there is an EFTA-US agreement, and also on whether or not spillovers are actually realized. Starting first with Figure III-15, the goods sectors are the primary beneficiaries (when output expands) and primary victims (when output contracts) in terms of relative changes in output. This is not surprising. From Figure III-9, NTB related cost reductions are higher for goods than for services. This implies greater impact on these sectors, especially as we move to progressively deeper agreements. Because both the US and the EU are highly protective of processed foods (including meat and dairy, but other foods as well) the Swiss processed foods industry is actually a potential net winner from T-TIP. Furthermore, turning to manufacturing, a combination of a parallel EFTA-US initiative together with spillover benefits from regulatory convergence could be quite beneficial to Swiss industry. However, like the overall impact on Swiss GDP, the impact on manufacturing again depends strongly on whether the EU-US agreement is purely bilateral, the depth of such an agreement, and whether or not it proves strictly discriminatory. These issues are examined in more detail in the report. Finally, in services fewer changes in market access policies are anticipated, and as such the effects are smaller than for goods.

Turning next to Figure III-16, we again see that not only does the question of a flanking EFTA-US agreement loom large. So too does the question of spillovers. In absolute terms, this is especially important for the manufacturing sector. Mirroring the GDP effects in Figure III-14, when a deep agreement is purely discriminatory in its application, we estimate a drop of almost 1.5% in Swiss manufacturing output. In contrast, once we bring scope for regulatory spillovers into the mix, comparing Figure III-15 and Figure III-16 we see that even with a strict bilateral deal between the EU and US, the Swiss manufacturing sector benefits overall. This is then greatly reinforced with a flanking EFTA-US agreement.

Figure III-15 Changes in the Structure of Swiss Output

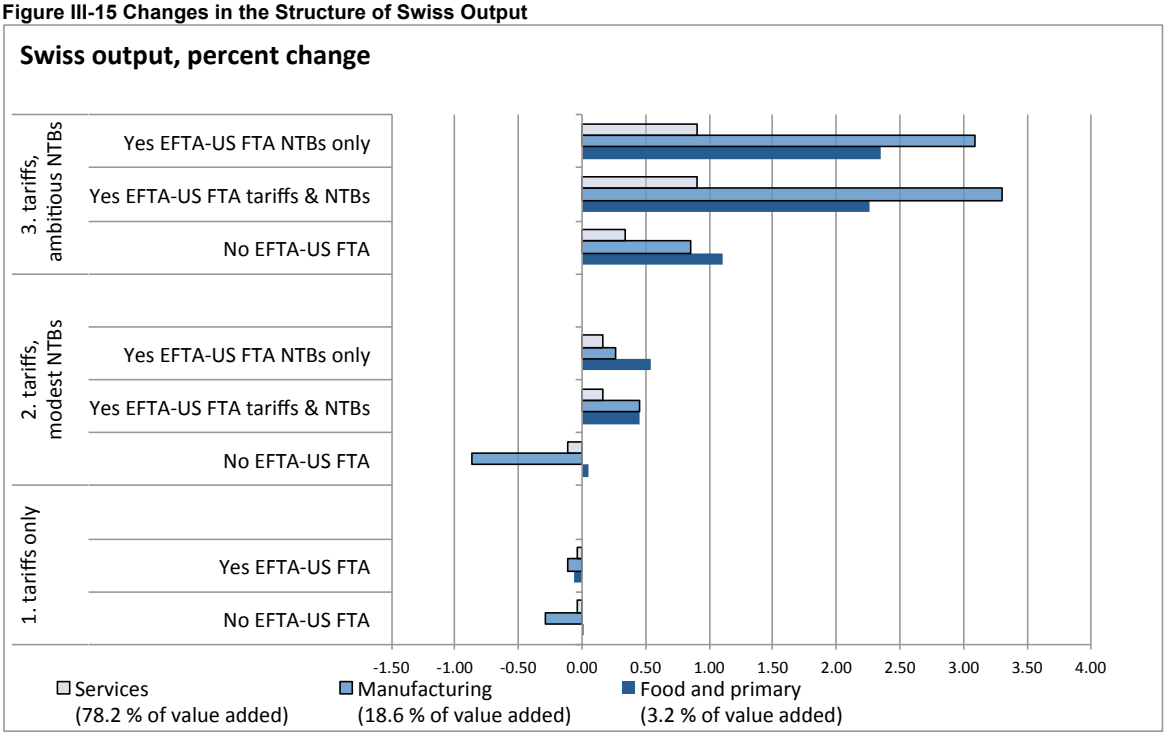


Figure III-16 Spillovers and the Structural of Swiss Output

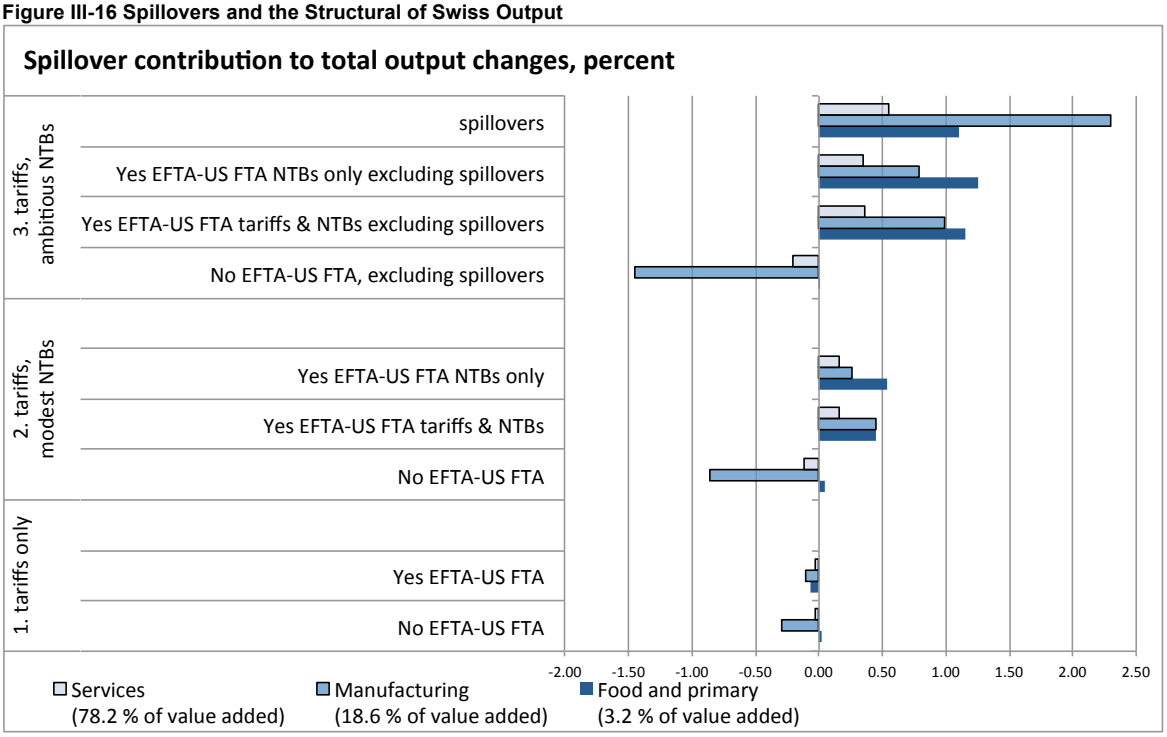


Table III-6 Breakdown in GDP by Sector Components of Experiments

	EU-US tariffs	EFTA-US tariff agree-ment	EU-US NTBs goods	EU-US NTBs services	EFTA-US NTBs goods	EFTA-US NTBs services	Spill-overs
1. tariffs only	-0.17	0.08					
2. tariffs,modest NTBs	-0.17	0.08	-0.34	0.00	0.90	-0.01	
3. tariffs, ambitious NTBs	-0.17	0.09	-0.70	0.00	1.74	-0.00	1.84

Table III-7 presents a different decomposition, where we focus on goods versus services, as well as NTBs versus tariffs. The basic message made above is reinforces, with the additional point that almost all the impacts relate to trade in goods, and in particular NTBs for goods. This is consistent with other recent assessments for the EU itself (see ECORYS 2013). One final message Table III-7 and from Figure III-16 relates to the form that mutual recognition of standards might take under T-TIP. In the figure and table, spillovers, conceptually, capture some NTB harmonization (and so effectively a reduction for third countries) between the EU and US. This is one possible negotiation path. Alternatively if the solution for negotiated recognition of differences in regulatory systems is to establish some sort of deliberately discriminatory country of origin based mutual recognition mechanism for conformity assessments under divergent national regulations, all third country exporters (including Switzerland) would then be worse off.

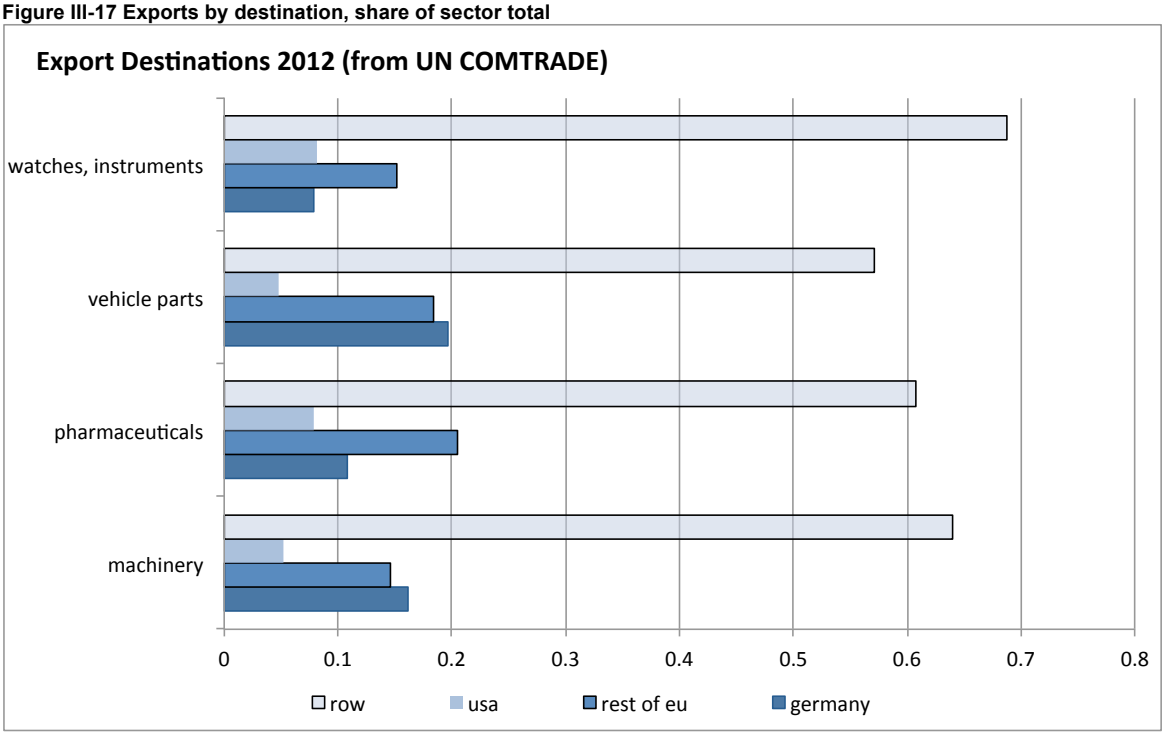
D. Partial Equilibrium Analysis

We turn next to a partial equilibrium (PE) assessment of trade for specific products. This is based on the GSIM simulation model (Francois and Hall 2003), and the analysis here is not linked to the main CGE assessment. Unlike the core assessment based on the CGE model, the partial equilibrium model we work with in this section is designed to look at more specific sectors, beyond those we can cover in a CGE model. To do this, we look at these sectors in isolation from the broader impact across sectors. As such, while the PE assessment here helps us to gauge possible effects for individual sectors lost in the aggregation of the CGE model, we must also keep in mind that general equilibrium effects (like competition across sectors for capital and labour) and longer-run effects linked to investment are not explicitly included in the model. With these caveats in mind, the pattern of results from the PE analysis does provide insight into the cross-scenario variation in impacts on individual sectors.

We focus on the following sectors: machinery (HS 84-85); pharmaceutical products (HS 28-38); precision instruments and watches (HS 90-91); motor vehicle parts (HS 87); and. The impact of T-TIP in these sectors will hinge on both relative market shares for destination markets (where Swiss producers export) and underlying barriers. Figure III-17 below shows the relative importance of EU, US, and third country markets for Swiss exports, based on COMTRADE data for 2012.

In motor vehicle parts and components, roughly 40 percent of Swiss exports are destined for the EU. This means that, to the extent that US firms gain a relative cost advantage in the EU under T-TIP, this will be important to Swiss firms because of the relatively large share of production destined for the EU market, and so facing stiffer competition from US firms. The same holds for machinery under HS 84-85, and pharmaceuticals under HS 28-38, where 31 percent of Swiss exports in each market are destined for the EU. Much of this is destined specifically for Germany. In all of the markets shown, the US is a relatively small export destination. The US is roughly 8 percent of exports for both pharmaceuticals, and for precision instruments and watches. This means any additional access gained in the US market, if there were a parallel Swiss-US or EFTA-US agreement, might not offset the loss of relative preferential access in the EU market.

Figure III-17 Exports by destination, share of sector total



Note: figures are share of total, so sum to 1 within a sector.

Table III-7 above summarizes scope for liberalization (by which we mean the size of possible tariff reductions) under T-TIP. Estimated NTBs are directly from the ECORYS study, estimated either for the exact products we are looking at here (machinery, pharmaceuticals, precision instruments and watches) or from the broader aggregates (vehicle part from vehicles and parts). Applied tariff rates are generally higher for all these sectors in the EU that in the US, especially for motor vehicle parts. In all cases, we do not expect the T-TIP to change access to the EU market directly for Swiss firms, and even a specific parallel Swiss agreement with the US will only affect access to the US and not the EU market directly. As such, the combination of trade barriers and destination shares means that what will matter most, in terms of the impact of T-TIP itself, is the potentially improved access for US firms competing with Swiss ones.

Table III-8 below presents our estimates of the impact of T-TIP, following the same basic scenario structure as in the CGE assessment. We focus on the impact on Swiss production, working from a 2012 baseline level of production and trade. (While the CGE model has been projected along a macroeconomic baseline, we work here with current rather than projected data, as we have no basis for projections at the detailed product level). From the table, a number of results stand out. First, for all products the deeper the trade agreement between the EU and the US the greater is the impact on Swiss industry. This is fully consistent with our discussion above of potential liberalization and underlying Swiss export destinations. What is somewhat surprising, though, is that although the

impact on Swiss industry also hinges on a possible EFTA-US agreement this is not consistent across products. In particular, taking the example of motor vehicle parts, Swiss specific tariffs yield an estimates tariff equivalent in the sector (from UNCTAD) of 22 percent against US suppliers, while the corresponding US barrier is only 1.02 percent. We see a similar patter for watches and precision instruments. Such tariff asymmetries

Table III-7 Baseline for Trade Barrier Reductions, percent

		Tariffs	Actionable NTBs, %
EU	machinery	2.91	25.45
	pharmaceuticals	2.98	22.35
	vehicle parts	10.85	15.8
	precision inst., watches	3.9	22.25
US	machinery	1.15	18.25
	pharmaceuticals	0.66	11.9
	vehicle parts	1.02	17.4
	precision inst., watches	1.71	24.65

source: WITS, MAcMAPS, and ECORYS.

Table III-7 above summarizes scope for liberalization (by which we mean the size of possible tariff reductions) under T-TIP. Estimated NTBs are directly from the ECORYS study, estimated either for the exact products we are looking at here (machinery, pharmaceuticals, precision instruments and watches) or from the broader aggregates (vehicle part from vehicles and parts). Applied tariff rates are generally higher for all these sectors in the EU that in the US, especially for motor vehicle parts. In all cases, we do not expect the T-TIP to change access to the EU market directly for Swiss firms, and even a specific parallel Swiss agreement with the US will only affect access to the US and not the EU market directly. As such, the combination of trade barriers and destination shares means that what will matter most, in terms of the impact of T-TIP itself, is the potentially improved access for US firms competing with Swiss ones.

Table III-8 below presents our estimates of the impact of T-TIP, following the same basic scenario structure as in the CGE assessment. We focus on the impact on Swiss production, working from a 2012 baseline level of production and trade. (While the CGE model has been projected along a macroeconomic baseline, we work here with current rather than projected data, as we have no basis for projections at the detailed product level). From the table, a number of results stand out. First, for all products the deeper the trade agreement between the EU and the US the greater is the impact on Swiss industry. This is fully consistent with our discussion above of potential liberalization and underlying Swiss export destinations. What is somewhat surprising, though, is that although the impact on Swiss industry also hinges on a possible EFTA-US agreement this is not con-

sistent across products. In particular, taking the example of motor vehicle parts, Swiss specific tariffs yield an estimates tariff equivalent in the sector (from UNCTAD) of 22 percent against US suppliers, while the corresponding US barrier is only 1.02 percent. We see a similar patter for watches and precision instruments. Such tariff asymmetries mean that, for some products in the table, tariff reductions between the EU and US across the scenarios lead to a slightly greater loss in total shipments of Swiss producers, relative to the baseline T-TIP scenarios. For all sectors, it is the case that a Swiss-US agreement that reduces NTBs is beneficial to the sectors concerned, relative to baseline T-TIP scenarios. For example, in pharmaceuticals, we estimate that a deep T-TIP, with ambitious NTB reductions, would lead to a 1.67 percent drop in Swiss-based production. This loss is reduced to 0.83 percent (it is reduced by more than half) if there is a parallel tariff and NTB agreement between EFTA and the US. However, it is clear, and so important to keep in mind, that even a parallel agreement involving both the US and Switzerland will not always be sufficient to offset totally the potential for reduced output due to the T-TIP itself.

Table III-8 Change in Value of Swiss-based Production, percent

	1. tariffs only		2. tariffs, modest NTBs			3. tariffs, ambitious NTBs		
	No EFTA-US FTA	Yes EFTA-US FTA	No EFTA-US FTA	Yes EFTA-US FTA tariffs & NTBs	Yes EFTA-US FTA NTBs only	No EFTA-US FTA	Yes EFTA-US FTA tariffs & NTBs	Yes EFTA-US FTA NTBs only
Machinery (HS 84-85)	-0.10	-0.02	-0.23	0.01	-0.07	-0.46	0.02	-0.06
Pharmaceuticals (HS 28-38)	-0.37	-0.33	-0.86	-0.48	-0.52	-1.67	-0.79	-0.83
Motor vehicles parts (HS 87)	-0.64	-1.35	-0.85	-1.39	-0.68	-1.19	-1.48	-0.77
Precision instruments and watches (HS 90-91)	-0.26	-0.42	-0.53	-0.27	-0.12	-0.83	0.05	0.20

Source: partial equilibrium estimates.

IV. Qualitative Assessment of T-TIP and Swiss Services Trade

A. Problem and Approach

At this time, information on emerging levels of concessions to be made in the negotiations is not available. They are at a very early stage. It is unsettled whether negotiations will be conducted on the basis of a positive or a negative list (European Commission 2013:4). In some areas, such as financial services, it is yet unclear whether the matter will at all be taken up (Johnson and Schott 2013:1; Oliver and Donnan 2014). A qualitative assessment of T-TIP therefore cannot be provided at this stage. The analysis presented here is thus based upon a comparison and extrapolation with existing FTAs both of the US and of the EU. We also note that the results of parallel negotiations with the Trans-Pacific Partnership Agreement (TPP) including the United States and Japan, as well as Australia, Brunei, Chile, Canada, Malaysia, Mexico, New Zealand, Peru, Singapore and Vietnam are not yet available. Similarly the Canada-EU Trade Agreement (CETA), while politically concluded, has not made available any texts upon which a comparison could be based.

In completion of the mandate, we first elaborate historical patterns in EU and US PTAs with respect to the regulatory structure of the services chapter, and discuss the findings in respect to the possible regulatory outcome of the negotiations under the T-TIP. By drawing from different datasets, we continue the discussion by comparing the level of liberalization in EU and US PTAs in trade in services *vis-à-vis* the level of commitments of the EU and the US under the GATS. Results from this general overview of levels of liberalization will be discussed with regard to the expected general levels of liberalization in the T-TIP.

Having established both the background for the regulatory structure of the T-TIP, and the expected level of liberalization, we further deepen the insights on the implications of the T-TIP on the identified services sectors with a case study on the two PTAs *US-Korea (2007)* and *EU-Korea (2010)* (for a similar approach, see Hufbauer and Baldwin 2006:151-184). The analysis of the regulation and level of liberalization the five service sectors of particular interest will help to inform expectations of the outcome of the T-TIP, taking into account that the bilateral agreement is likely to be slightly deeper than the level of existing agreements. We quantify the levels expected and compare them to existing and potential trade flows between the EU, the US and in relation to Switzerland based on a gravity model.

On a side note, relevant aspects of the T-TIP for the Swiss services industry are roughly outlined: 1) whether the T-TIP may develop an impact on Swiss licensing trade, 2) how a

mutual recognition agreement in services between the US and the EU affects the Swiss services industry, and 3) what is likely to be expected for multilateral and future preferential services trade regulation by the T-TIP.

B. History of Preferential Services Trade Regulation and Liberalization

In the area of services trade regulation, the prime efforts were made by the GATS. Prior to advanced negotiations on multilateral trade regulation of services, only a handful of PTAs worldwide included services trade provisions, in particular the US Canada Free Trade Agreement preceding NAFTA. Historically, preferential services trade regulation has, thus, been strongly influenced by negotiations on GATS during the Uruguay Round (1986-1993) and eventually its results, both in scope and in the regulatory structure. While the GATS was meant as a stepping stone for successive multilateral rounds of liberalization, the initial liberalizing commitments under the GATS turned out to be and remain relatively limited in scope. Multilateralism to date has not achieved higher levels of liberalization in services trade as compared to the initial levels of the GATS in 1995. Countries, therefore, have turned to preferentialism to increase trade liberalization in services, along with further developing services trade regulation in general (see Cottier et al. forthcoming 2015). More recently, multilateral efforts outside of GATS were made in Geneva,[11] yet without producing particular results.

1. Preferred Regulatory Structure in the US and the EU

The majority of PTAs in services follows the general scope and structure of the GATS narrowly. Of the different countries substantially involved in PTAs in services, the EU and the US are among the most active ones. Over time, both have developed their own scope and structure of services trade regulation in PTAs, which is relatively independent from the initial GATS model. Interestingly, however, the US and the EU model of services trade regulation are not identical.

a) The EU Model

Derived from the Design of Trade Agreements (DESTA) dataset,[12] the following table illustrates the main features of the regulatory structure of preferential services trade by the EU:

[11] See for a regular update on the on-going negotiations over a plurilateral trade agreements in services (TISA) e.g.: http://www.seco.admin.ch/themen/00513/00586/04996/index.html?lang=de.

[12] DESTA is a collabourative research project between researchers of the universities of Bern, Salzburg, London, and Oxford. It aims at systemically collecting data on various types of PTAs; see DÜR, ANDREAS, BACCINI, LEONARDO, AND ELSIG, MANFRED (2014) ,The Design of International Trade Agreements: Introducing

PTA (EU)	Year	appr	MFN	NT	mode 3	mode 4	focus sectors
EC Amsterdam	1997	neg	no	yes	yes	yes	financial, transport
EC Jordan	1997		no	no	yes	no	transport
EC Nice	2001	neg	no	yes	yes	yes	financial, transport
EC Chile	2002	neg	no	yes	yes	yes	communication, energy, financial, tourism, transport
EC Lisbon	2007		no	yes	yes	yes	financial, transport
EC Korea	2010	pos	yes	yes	sep	sep	computer, communication, financial, transport, electronic commerce
EC Central America	2012	pos	yes	yes	sep	sep	computer, courier, communication, financial, transportation, electronic commerce
EC Colombia Peru	2012	pos	no	yes	sep	sep	computer, postal and courier, communication, financial, transportation, electronic commerce
CETA	201?	neg	?	?	?	?	?

Mutual recognition: Korea = to be negotiated, Central America = provisions on mutual recognition already included, Colombia and Peru = provisions on mutual recognition already included, CETA = to be negotiated.

Explanation:
The data in the table is an extract from the coding of the DESTA dataset of PTAs in services, as undertaken for the doctoral thesis on 'South-South Preferential Trade Agreements in Services' by Charlotte Sieber-Gasser. This is a reflection of the provisions in the main treaty text. Schedules are not taken into consideration.

More recent European PTAs in services are marked by a positive list approach to services trade liberalization, they restrict the scope of application of the services chapter to modes 1 and 2 supply of services, and they include modes 3 and 4 supply of services in separate chapters on financial services and temporary movement of natural persons respectively. Furthermore, more recent European PTAs in services include a number of special chapters in the main treaty text on service trade related issues, such as computer services, courier services, and electronic commerce. Arguably both characteristics contribute to a larger scope of application of trade regulation in services than would be provided through the standard structure of the GATS: regulatory flexibility in the Schedules of commitments is limited compared with the flexibilities in the main treaty text.

a New Dataset', *Review of International Organizations*, forthcoming. See also [Online], Available at: http://www.designoftradeagreements.org (last visited January 29 2014).

Services trade liberalization in European PTAs more and more is coupled with mutual recognition agreements. As recognition continues to be one of the most relevant barriers to trade in services, such mutual recognition arrangements may adversely affect market access for outsiders.

b) The US Model

Derived from the same dataset, the following table illustrates the main features of the regulatory structure of preferential services trade by the US:

PTA (US)[13]	**Year**	**appr**	**MFN**	**NT**	**mode 3**	**mode 4**	**focus sectors**
NAFTA	1992	neg	yes	yes	sep	yes/sep	professional, communication, financial, tourism
US Chile	2003	neg	yes	yes	sep	yes/sep	professional, communication, financial, electronic commerce
US Singapore	2003	neg	yes	yes	sep	yes	professional, communication, financial, electronic commerce
CAFTA DR	2004	neg	yes	yes	sep	yes	professional, communication, financial, electronic commerce
US Australia	2004	neg	yes	yes	sep	yes	professional, communication, environment, financial
US Morocco	2004	neg	yes	yes	sep	yes	professional, communication, financial, electronic commerce
US Peru	2006	neg	yes	yes	sep	yes	professional, communication, financial, electronic commerce
US Korea	2007	neg	yes	yes	sep	yes	professional, financial
US Panama	2007	neg	yes	yes	sep	yes	professional, communication, financial, electronic commerce
TPP	201?	?	?	?	?	?	?

Mutual recognition: NAFTA = to be negotiated and sympathetically considered, Chile = no provisions on mutual recognition, CAFTA DR = provisions on mutual recognition already included, Korea = provisions on mutual recognition already included, Morocco = provisions on mutual recognition already included, Australia = to be negotiated, Panama = provisions on mutual recognition already included, Peru = to be negotiated, Singapore = to be negotiated.

Explanation:

The data in the table is an extract from the coding of the DESTA dataset of PTAs in services, as undertaken for the doctoral thesis on 'South-South Preferential Trade Agreements in Services' by Charlotte Sieber-

[13] The US is furthermore member of US-Canada (1988), US-Jordan (2000), US-Vietnam (2000), US-Bahrain (2004), US-Colombia (2006), and US-Oman (2006). Coding of these PTAs showed no difference to the results in the table above.

Gasser. This is a reflection of the provisions in the main treaty text. Schedules are not taken into consideration.

Contrary to the EU, the US has a history of a uniform regulatory structure in their PTAs over the past 10 years, the so-called NAFTA model: preferential trade liberalization in services is based on a negative list approach, and mode 3 supply of services is excluded from the application of the services chapter. Mode 3 supply of services is embedded in the separate chapters on financial services and investment. This provides for a slightly larger scope of liberalization in financial services and mode 3 supply of services.

The US PTAs furthermore provide for separate chapters on financial services, communication, professional services and electronic commerce in the main treaty text. These sectors of particular interest are not entirely identical with the EU interests (transportation, postal and courier services, computer services, temporary entry of natural persons). If services related chapters are included in the main treaty text, this is most likely an additional disadvantage for outsiders: regulatory flexibility is broader in the main treaty text as compared to the regulation in the Schedules of commitments, and therefore, economic integration is bound to be deeper in the sectors which are separately listed in the main treaty text.

With respect to mutual recognition agreements, the US PTAs do not show a constant pattern in the past: while the majority makes a reference to mutual recognition, in particular in the Annex on professional services, there are some US PTAs with no mention of mutual recognition, some which provide for mutual recognition regulation, and some which outline future negotiations on mutual recognition only.

c) Regulatory Structure of the T-TIP

With respect to the T-TIP, it would seem intuitive that the EU would prefer a positive list approach along with separate chapters on modes 3 and 4 supply of services, as established by the more recent European PTAs in services. However, word has it that the Canada-EU Trade Agreement (CETA) services chapter will be based on a negative list approach (Ioannidis 2014). Given that the CETA will most likely serve as a dress rehearsal for the T-TIP (Höltschi 2013) the outcome of the services trade negotiations between the EU and Canada will be decisive for the structure of the services chapter in the T-TIP.

Thus, in the light of the on-going negotiations on the CETA, it is impossible to derive the likely regulatory structure of the services chapter in the T-TIP from the history of European PTAs in services: while more recent European PTAs in services are based on a positive list approach, e.g., the CETA will be based on a negative list approach. However, the regulatory structure of the services chapter in the T-TIP – particularly with respect to separate regulation of modes 3 and 4 supply of services – will impact on the overall level of regulatory coherence and liberalization and is, therefore, relevant for Swiss services and service providers.

With respect to the impact of the T-TIP on Swiss services and service suppliers, attention needs to be paid next to financial services also to the Annex to the chapter on services trade on professional services. It is likely that the US here has already established a basic set of provisions and a general level of liberalization in professional services, that they would wish to extend in general also to a free trade agreement with the EU. The Annex on professional services, together with the Schedule of commitments, should, therefore provide insights on what to expect from the US side in a future services chapter of the T-TIP. Naturally, the same holds true for financial services.

Given that the EU PTAs tend to have more separate services related chapters in the main treaty text – e.g. on transportation, courier and postal services, computer services, it will be interesting to see on what the parties to the T-TIP agree with respect to separate chapters in the main treaty text. While the level of liberalization in each sector and subsector can easily be established through the Schedule of commitments, additional regulation and binding principles for specific sectors can mainly be introduced through separate chapters in the main treaty text. The number of separate services related chapters in the main treaty text will, thus, impact further on the overall prospects of market access for Swiss services and service suppliers on the US and EU market.

Another difference between the EU PTAs in services and the US PTAs in services is the focus of EU PTAs also on the temporary entry of natural persons: the EU, particularly in the more recent PTAs, provides for an entire chapter on the temporary stay of natural persons, including essentially mode 4 supply of services. The majority of the US PTAs do not provide for a separate chapter on the temporary stay of natural persons, and the scope of liberalization with respect to mode 4 supply of services can be considered to be very limited. Also in this respect, it will be interesting, how the T-TIP finally turns out. Since mode 4 supply of services only accounts for a limited share of overall Swiss services exports, it may be less relevant for the industry as a whole, if US and EU service suppliers are provided with a comparative advantage vis-à-vis Swiss service suppliers in this respect. However, if commitments in the temporary stay of natural persons in the T-TIP go beyond the regulatory scope of mode 4 supply of services – e.g. through a separate chapter on the temporary stay of natural persons – this may indeed affect the Swiss economy. Swiss companies will then suffer from additional barriers to mode 3 supply of services and to establishing branches in the US or EU market as compared with US or EU firms.

Most European PTAs already include provisions on mutual recognition, while the outcome of the analysis of US PTAs in services shows mixed results. This is particularly relevant in the case of preferential services trade liberalization, as the bulk of barriers to services trade derive from issues related to recognition. Given that apparently mutual recognition will be included in the CETA (e.g. Gauthier and Holden 2010), and considering the history of European PTAs in services, it is likely that the T-TIP will include provi-

sions on mutual recognition. Such an agreement would most certainly pose a challenge to Swiss services and service suppliers in all service sectors.

2. Level of Liberalization in PTAs *vis-à-vis* the GATS in the US and the EU

According to GATS Art. V, PTAs in services generally have to liberalize trade with substantial sectorial coverage of service sectors and modes of supply, in order to qualify for an MFN exemption (Cottier and Molinuevo 2008; Adlung and Carzaniga 2009; Islam and Alam 2009).[14] Thus, generally, PTAs in services would be expected to more or less fully open services sectors for preferential trade while allowing for limited exceptions. However, while most PTAs indeed provide for better market access as compared to the level under the GATS, the different levels of liberalization achieved under PTAs differ greatly: from a reference to GATS-commitments in trade liberalization in services, to a copy of the GATS commitments, to more or less full liberalization of services trade among the parties to a PTA, basically all variations of different levels if liberalization under a PTA exist to date.

Because the compliance of PTAs with GATS Art. V has so far not been subject to WTO dispute settlement, it is unclear how Members and the WTO would deal with a PTA that is officially termed 'unlawful' under WTO law. Meaning that, while GATS Art. V in theory establishes relatively clear requirements and conditions that have to be met by a PTA in services, it has been so far of limited practical consequence, similar to trade in goods where comparable disciplines and difficulties exist under Article XXIV GATT. Both the US and the EU stated that they plan to be compatible with GATS requirements for preferential trade. The T-TIP is, thus, likely to comply with the basic requirements of GATS Art. V[15] – because overtly violating commitments under the WTO law would send the wrong message – while otherwise tailoring commitments in trade liberalization to the individual country needs, just like in previous PTAs. The T-TIP is expected to provide for GATS+ market access in services, without, however, establishing full liberalization.

a) Scope of Liberalization in General

Marchetti and Roy (2008) developed a database for the WTO, which aims at illustrating the different levels of liberalization, both under the GATS and in PTAs.[16] The database provides data for 53 members in 67 PTAs. The level of liberalization is based on regulatory commitments only: full commitment is 100 per cent, no commitment is 0 per cent.

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[14] GATS Art. V:1: ‚This Agreement shall not prevent any of its Members from being a party to or entering into an agreement liberalizing trade in services between or among the parties to such an agreement, provided that such an agreement: (a) has substantial sectoral coverage, and (b) provides for the absence or elimination of substantially all discrimination […] between or among the parties […] through: (i) elimination of existing discriminatory measures, and/or (ii) prohibition of new or more discriminatory measures […]'.

[15] E.g. by covering most of the service sectors, and all of the modes of supply of services, while generally establishing modest GATS+ commitments for market access.

[16] See also [Online], Available at: http://www.wto.org/english/tratop_e/serv_e/dataset_e/dataset_e.htm (last visited January 30 2014).

Partial commitments are established on a cumulative basis, resulting in a percentage of market openness between 0 and 100 per cent. As MARCHETTI AND ROY (2008:78-9) rightly point out, this analysis does not necessarily reflect trade flows. It is merely an illustration of legal commitments independent from their economic weight.

Nevertheless, the database provides for insightful information on expected levels of liberalization in US and EU PTAs. While there is no certainty on actual impact on trade flows based on the percentages of trade openness in the database – e.g. the largest subsectors could be excluded from the PTA – the database nevertheless shows regulatory trends, which are bound to translate into economic outcomes sooner or later.

The table below is derived from said database, and shows the GATS+ percentages – the percentages of liberalizing commitments beyond the level of liberalization under the GATS – in US and EU PTAs:

PTA	**Percentage of GATS+ (GATS = 55.44)***
EU-Chile (2002)	+3.02
EU-CARIFORUM (2008)	+8.21
US-Singapore (2003)	+11.14
US-Peru (2006)	+11.48
US-Chile (2003)	+12.33
US-Morocco (2004)	+11.48
US-Bahrain (2004)	+11.48
US-Oman (2006)	+11.48
US-Colombia (2006)	+11.48
US-Korea (2007)	+12.59
US-Panama (2007)	+11.48
US-Jordan (2000)	0
US-Australia (2004)	+11.48

* By coincidence, both the US and the EU score 55.44 for general openness under the GATS.

The table shows that generally, the EU is more restrictive with respect to granting additional market access in PTAs in services: the two EU PTAs only score 3 and 8 points better than EU commitments. However, information on EU PTAs is scarce, as the database only includes two EU PTAs. Thus, it is likely that the EU is less restrictive in more recent PTAs than *in EU-Chile (2002)* and *EU-CARIFORUM (2008)*, especially since the latter is an Economic Partnership Agreement (EPA) and not a PTA. Because the methodology used in the database is not entirely made public, it is not possible to compile comparable data on EU PTAs that are not yet included in the dataset.

On US PTAs, however, there is quite some substantial information to be found in the database: 11 US PTAs are included, of which 7 score 11.48 points better than US GATS commitments. Two US PTAs provide for even better market access, scoring more than

12 points better than US GATS levels. On the other hand, two US PTAs provide for less than the seemingly standard level of 11.48 points extra to GATS: *US-Singapore (2003)* provides with 11.14 just slightly less market access and *US-Jordan (2000)* provides for no additional market access as compared to GATS levels of liberalization. Nevertheless, the list of general levels of liberalization in US PTAs indicates that US commitments under the T-TIP are in general expected to be at least 11.48 per cent above the US levels of liberalization under the GATS.

Given that both the US and the EU have large services markets, even higher levels of liberalizing commitments are likely than under previous US and EU PTAs: the T-TIP provides for a considerable economic and political incentive for opening services markets in both the US and the EU.

b) Scope of Liberalization in Sectors of Interest

The same database also provides for sectorial data, which allows to compare GATS levels of liberalizing commitments per sector with the 'best' commitment under one of the US or EU PTAs in the database. The database does not include information on which of the PTAs provided for the 'best' commitment, but as the table below illustrates well, it provides for an illustration of the general margin for preferential liberalization in each of the sectors of interest:

Sector	**GATS (EU)**	**GATS (US)**
Financial Services	43	29
Insurance	58	40
Transportation		
Maritime	48	0
Air	66	5
Auxiliary	57	43
Professional Services	59	58
Distribution	72	100
Tourism	83	83

Sector	**PTA max. (EU)**	**PTA max. (US)**
Financial Services	43	33+
Insurance	58	50+
Transportation		
Maritime	63+	44++++
Air	73+	29+++
Auxiliary	71++	64++
Professional Services	63+	63+
Distribution	88++	100
Tourism	83	83

Scale of 0 to 100, with 100 = full commitment; limited to mode 1 and mode 3 commitments, EU = EU-15; Source: http://www.wto.org/english/tratop_e/serv_e/dataset_e/dataset_e.htm.

Explanation:
+ = GATS-plus
++ = more than 10 more than GATS

+++ = more than 20 more than GATS
++++= more than 30 more than GATS

Both the US and the EU did not yet conclude a PTA, which goes beyond the level of commitments under GATS in tourism services. However, the general level of openness in this service sector is in both cases already relatively high, leaving limited scope for additional liberalization (both score 83).

The US provides already for full liberalization of distributional services under the GATS, thus, the T-TIP will not in any case provide for a competitive advantage through increased market access for European distributional services and service providers vis-à-vis Swiss services and service providers. The EU, however, has already gone beyond the scope of its GATS commitments in PTAs in distributional services (72 under GATS and up to 88 in PTAs). If the T-TIP is in line with previous European PTAs in this respect, it is likely that Swiss distributional services and service suppliers would have to deal with a lower level of market access compared to American services and service suppliers in this sector.

Market access in professional services tends to be slightly better in European and American PTAs than under the GATS (59/58 under the GATS and up to 63 in PTAs). The exact area of liberalization, along with the scope of additional commitments may be crucial for Swiss services and service suppliers in professional services: if additional commitments are in key sub-sectors such as architecture, engineering, leasing, consultancy, technical testing, accounting and auditing, or installation and maintenance, it may affect Swiss services and service suppliers more than if additional commitments are entered in other sub-sectors.

In the transportation sector, the database provides only for data on the level of openness in Maritime and Air Transportation Services, and in Auxiliary Transportation Services. This results in only a fragmented picture of the overall level of liberalization in transportation services. However, quite strikingly, the US transportation sector is more or less closed to multilateral liberalization, particularly in Maritime and Air Transportation services (0 and 5 under the GATS). In PTAs, the US has nevertheless committed to quite substantial market access in Maritime and Air Transportation Services (44 and 29 in PTAs). The situation is less extreme in the case of European market access in transportation services, but the EU has entered into GATS+ and GATS++ commitments in transportation sectors in PTAs as well. Preferential services trade liberalization between the US and the EU in this sector is, thus, likely to be substantial, and consequently also likely to affect Swiss transportation services and service suppliers both on the European and the American market [Check impact of existing Swiss US open sky agreement].

In financial services and insurance, the EU has not yet concluded PTAs with GATS+ commitments, to the contrary of the US. (This is particularly interesting in the light of US opposition to include financial services in T-TIP). However, preferential liberalization in financial services in the US and the EU has been moderate (US: 29 under the GATS and 33 in PTAs) or inexistent (EU: GATS and PTAs both score 43) to date. US preferential

market access in insurance services has, however, been relatively substantial (40 under the GATS and up to 50 in PTAs). It may be relatively unlikely, that the T-TIP establishes substantial additional liberalizing commitments in these sectors. Thus, mainly with respect to the American market for insurance services, the T-TIP may impact noticeably negative on Swiss insurance services and service suppliers. Given the general importance of financial and insurance services for the Swiss economy, the unlikely case of substantial preferential liberalization in these sectors under the T-TIP, may, however, affect a large number of Swiss services and service suppliers.

c) Expected General Level of Liberalization in the T-TIP

Generally, the T-TIP is expected to provide for substantial liberalization in trade in services (see Fagan 2013:3). While it is unlikely that the T-TIP is going beyond the scope of GATS regulation (GATS-extra) with respect to services trade,[17] the T-TIP may nevertheless provide for GATS+ commitments with considerable economic scope.[18] It is not possible to date to predict the level of additional liberalization among the US and the EU based on a historical analysis of their commitments in PTAs. However, anything below the level of already provided GATS+ commitments in US or EU PTAs would be a surprise.

C. Commitments under US/EU – Korea PTAs: A Case Study

Arguably, the CETA and the TPP are going to be most influential on the outcome of the T-TIP negotiations. However, as to date little is known about the regulatory structure and the scope of liberalization achieved under these two PTAs, it is hardly possible to make predictions derived from these potential model PTAs. Furthermore, most of the US and EU PTAs in force today are not comparable to the T-TIP in terms of market size and political power involved. In order to nevertheless estimate the potential regulatory and liberalizing impact of the T-TIP on the sectors of interest, we continue the discussion with a case study on the US and EU PTA with Korea.

Both PTAs are relatively recent (2007 for the US, and 2010 for the EU PTA), and both are relatively substantial in terms of liberalizing commitments vis-à-vis a young and important emerging industrialized country. Both PTAs reflect the corresponding preferred regulatory structure of the services chapter of the US and the EU. Thus, arguably, the US and the EU were both able to shape the scope and structure of the PTA with Korea according to their agenda. Finally, Korea – as compared with other members of US and EU PTAs in services – provides for a large services market (e.g. Park and Shin 2012).

[17] Because neither the US nor the EU have done so in the past in PTAs.

[18] Because 1) that is mandatory given the requirements of GATS Art. V, and 2) both the US and the EU have quite substantially extended liberalizing commitments in PTAs in the past.

Nevertheless, the case study can only serve as a background to the T-TIP, given that the political power and size of markets differ considerably between Korea and the US and EU respectively.

1. Financial Services

Generally, financial services are at the heart of the Korean PTAs, providing for substantial additional market access to the Korean market in both PTAs (Song 2011:3). While greater access to the Korean financial services market arguably was one of the major achievements for the US and the EU, they both offered little additional market access to their financial services markets in return.

In *EU-Korea (2010)* financial services are liberalized on the basis of a positive list approach. The general commitments and regulations for the liberalization in trade in services are further clarified in Sub-Section E of the main treaty text with respect to financial services. The most striking feature of the services chapter in *EU-Korea (2010)* is arguably Art. 7.42, which extends the scope of application of the PTA to new financial services: provided that national laws do not have to be introduced or modified, also new financial services, not previously listed in the agreement, would fall under the scope of the agreement.[19] As indicated previously, *EU-Korea (2010)* split the regulation of commitments in the four different modes of supply of services across the services related chapters. This is also reflected in the schedule of commitments: there are three services related schedules, one for modes 1 and 2 supply of services, one for mode 3 supply of services, and one for mode 4 supply of services.

US-Korea (2007) liberalizes financial services on a negative list approach. General commitments and regulations for the liberalization of financial services are spread over the chapters on cross-border services trade, on financial services and on investment. While mode 4 supply of services is generally exempted from the chapter on cross-border trade in services, it is *de facto* included in both the chapters on investment and on financial services. The scope of commitments in financial services includes new financial services as well,[20] and based on the MFN clause, additional preferential commitments undertaken in third country PTAs are automatically extended to *US-Korea (2007)* even if these additional commitments initially were exempted from the scope of application of *US-Korea (2007)* in the schedule of reservations.[21] The scope of application of *US-Korea (2007)*, also with respect to GATS+ and GATS-extra commitments in financial services, is therefore slightly larger than the one of *EU-Korea (2010)*. Also, the regulation of financial services is substantially more extensive than cross-border trade in services, both in the

[19] *EU-Korea (2010)*, Art. 7.42: ‚Each party shall permit a financial service supplier of the other Party established in its territory to provide any new financial service [...] provided that the introduction of the new financial service does not require a new law or modification of an existing law. [...]'.

[20] *US-Korea (2007)*, Art. 13.6: ‚Each party shall permit a financial institution of the other Party to supply any new financial service that the Party would permit its own financial institutions, in like circumstances, to supply without additional legislative action by the Party. [...]'.

[21] *US-Korea (2007)*, Art. 13.3.

main treaty text and in the Annexes. This suggests and underlines the relative interest in liberalizing trade in financial services.

a) Banking

The *EU-Korea (2010)* PTA provides for an extensive definition of banking and banking related services, identical to the one provided under the Annex to the GATS on Financial Services.[22] Basically, everything which is not insurance or insurance related is considered to be a banking or banking-related service.[23] In the schedule of commitments, banking services and other financial services are treated as a single group, without further distinction of sub-sectors. With respect to modes 1 and 2, commitments by the EU are limited, with a tendency to 'unbound'.[24] Commitments in mode 3 are limited through requirements of national and European laws.[25] With respect to mode 4 supply of financial services, finally, the majority of EU members are unbound, while the rest imposes residency and nationality conditions.[26] Comparing the commitments of the EU on financial services liberalization under the *EU-Korea (2010)* with its commitments under the GATS – without going into too much detail – the impression is, that the EU, except for adding new financial services to the scope of application of liberalizing commitments, did not go beyond GATS levels of liberalizing commitments.[27]

The definition of 'banking and other financial services' in *US-Korea (2007)* is identical with the definition in the GATS and the definition in *EU-Korea (2010)*.[28] National treatment is provided only for a) the provision and transfer of financial information and financial data processing, and b) for advisory and auxiliary services relating to banking and other financial services.[29] Furthermore, the US allows for the provision of a) investment advice, and b) portfolio management services by Korean financial institutions organized outside the US territory.[30] Mode 4 supply of banking and other financial services is restricted by regulations concerning citizenship.[31] US federal law furthermore restricts national Treatment and Market Access for banking and other financial services.[32] Overall commitments are mainly with respect to the provision of financial data and information. US national legislation is reserved.

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[22] GATS, Annex on Financial Services, Art. 5.

[23] *EU-Korea (2010)*, Art. 7.37:2(b).

[24] *EU-Korea (2010)*, Annex 7-A-1, p. 1185.

[25] *EU-Korea (2010)*, Annex 7-A-2, p. 1222.

[26] *EU-Korea (2010)*, Annex 7-A-3, p. 1245-6.

[27] See European Communities and Their Member States, Schedule of Specific Commitments, GATS/SC/31, including Supplements 1-4 and their revisions.

[28] *US-Korea (2007)*, Art. 13.20.

[29] *US-Korea (2007)*, Annex 13-A.

[30] *US-Korea (2007)*, Annex 13-B.

[31] *US-Korea (2007),* Annex III-United States-4.

[32] *US-Korea (2007)*, Annex III-United States-5ff.

b) Insurance

In the *EU-Korea (2010)* PTA, insurance and insurance related services are defined in Art. 7.37:2(a) as follows:[33]

> (a) Insurance and insurance-related services: (i) direct insurance (including co-insurance): (A) life; (B) non-life; (ii) reinsurance and retrocession; (iii) insurance inter-mediation, such as brokerage and agency; and (iv) services auxiliary to insurance, such as consultancy, actuarial, risk assessment and claim settlement services;

The definition is identical with the one provided by the GATS Annex on Financial Services.[34] With a few exception relating to goods in international transit and maritime shipping and commercial aviation and others, modes 1 and 2 supply of insurance and insurance related services tend to be 'unbound' for EU members.[35] Mode 3 supply of insurance and insurance related services is restricted by requirements of national laws. Liberalization can generally be considered to be modest.[36] Similar to banking services, commitments in insurance and insurance related services in mode 4 are restricted through residency and nationality requirements.[37] From a preliminary comparison with GATS levels of liberalizing commitments in insurance and insurance related services, the commitments under *EU-Korea (2010)* seem to be slightly GATS+ in general.

In *US-Korea (2007)* insurance and insurance related services are also defined identically to the GATS definition and are, thus, identical to the insurance and insurance related services in *EU-Korea (2010)*.[38] National Treatment is provided for the cross-border supply of insurance risks relating to maritime shipping, commercial aviation, space launching and freight, as well as goods in international transit and reinsurance, retrocession and services auxiliary to insurance.[39] Limitations of commitments are relatively modest in the US schedule. Primarily National Treatment and mode 1 supply are limited, generally by national legislation on the state-level.[40] It is noteworthy, that the life insurance seems to be not covered by *US-Korea (2007)* to date.

2. Transportation Services

Sub-Section F of *EU-Korea (2010)* refers to international maritime transport services in particular. While this is so to say GATS+, it may be of lesser interest to Swiss service

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[33] *EU-Korea (2010)*, Art. 7.37:2.

[34] GATS, Annex on Financial Services, Art. 5.

[35] *EU-Korea (2010)*, Annex 7-A-1, p. 1182.

[36] *EU-Korea (2010)*, Annex 7-A-2, p. 1221-2.

[37] *EU-Korea (2010)*, Annex 7-A-3, p. 1245-6.

[38] *US-Korea (2007)*, Art. 13.20.

[39] *US-Korea (2007)*, Annex 13-A.

[40] *US-Korea (2007),* Annex III-United States-18ff.

suppliers, given the geographical situation of Switzerland [check impact for vessels flying Swiss flag in light of lacking commitments under GATS].

US-Korea (2007) excludes Air Transportation services from its scope of application.[41] Interestingly enough, services related to Air transportation are nevertheless mentioned in the list of reservations: commitments are limited by national legislation. Other sub-sectors of transportation fall, however, under the scope of application of the chapter on cross-border trade in services. Furthermore, commitments in transportation – as any other commitments in cross-border trade in services – are generally limited by the right to adopt or maintain measures not inconsistent with US commitments under GATS Art. XVI (Market Access).[42] The schedule of US-commitments under the GATS is for this purpose slightly amended, creating a minimum level of market access provided by *US-Korea (2007)* in any case, which is slightly better than the one under GATS.

a) Logistics

The Services Sectoral Classification List (W/120) does not provide for a separate sub-sector on logistics services. Logistics is usually covered by a number of other service sub-sectors, such as freight transportation, storage and warehousing or management consulting (US International Trade Commission 2005). Market access for logistics services is here estimated through a qualitative general assessment of the commitments in logistics related sub-sectors.

Particularly mode 2 supply of logistics related services are characterized by a number of liberalizing commitments: limitations tend to be none. However, liberalization of mode 1 supply of logistics related services tend to be very limited with a tendency to 'unbound' for all EU members.[43] Commitments of the EU with respect to mode 3 supply of logistics related services are quite limited and members are mostly unbound.[44] Commitments in mode 4 supply of logistics related services are very limited, imposing on the few commitments even conditions of national law.[45] A comparison with GATS levels of liberalizing commitments in logistics related services, shows that levels are more or less equal, while there might even be a tendency of GATS- in *EU-Korea (2010)*, given that a number of sub-sectors listed in the GATS schedule are not listed under *EU-Korea (2010)*.

Logistics related services are generally fully liberalized under *US-Korea (2007)* with the exception of mode 4 supply.[46]

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[41] *US-Korea (2007)*, Art. 12.1:4(c).

[42] *US-Korea (2007)*, Annex 2-United States-8.

[43] *EU-Korea (2010)*, Annex 7-A-1, pp. 1188-90.

[44] *EU-Korea (2010)*, Annex 7-A-2, pp. 1225-7.

[45] *EU-Korea (2010)*, Annex 7-A-3, pp. 1247-8.

[46] *US-Korea (2007)*, Annex II-United States-13.

b) Auxiliary Services to All Modes of Transportation

There is a clear pattern in the commitments of the EU commitments in *EU-Korea (2010)* for liberalization in modes 1 and 2 supply of services auxiliary to transport: mode 1 supply is unbound for all EU members, while there are no limitations for mode 2 supply of services auxiliary to transport.[47] Mode 3 supply[48] is mostly limited by national laws, as well as mode 4[49] supply of services auxiliary to transport. Possibly, the EU has committed to more sub-sectors of services auxiliary to transport in *EU-Korea (2010)* than under the GATS. The general pattern of liberalization remains, however, the same.

Auxiliary services to all modes of transportation are generally fully liberalized under *US-Korea (2007)* with the exception of mode 4 supply.[50]

3. Professional Services

In *EU-Korea (2010)* professional services are not considered with a separate section in the main treaty text. Commitments and regulations are to be found in the general section on trade in services, and in the Schedule of commitments. The qualitative analysis of levels of EU-commitments in professional services is, thus, primarily based on the commitments entered in the Schedule of commitments. The two tables below illustrate the preliminary analysis of EU-commitments in the sub-sectors of interest in *EU-Korea (2010)* with the EU-commitments under GATS:

Sub-sector *EU-Korea (2010)*	**Mode 1**	**Mode 2**	**Mode 3**	**Mode 4**
Engineering	>Unbound	None	<None	<None
Architecture	>Unbound	None	<None	<None
Leasing	>Unbound	<None	<None	<None
Consultancy	None	None	None	X
Technical Testing	>Unbound	>Unbound	None	<None
Accounting and Auditing	>Unbound	None	<None	<None
Installation and Maintenance	>Unbound	None	<None	<None

Sub-sector EU GATS	***Mode 1***	***Mode 2***	***Mode 3***	***Mode 4***
Engineering	*>Unbound*	*None*	*<None*	*<None*
Architecture	*>Unbound*	*None*	*<None*	*<None*
Leasing	*<None*	*<None*	*<None*	*>Unbound*
Consultancy	*None*	*None*	*None*	*>Unbound*
Technical Testing	*>Unbound*	*None*	*>Unbound*	*>Unbound*
Accounting and Auditing	*>Unbound*	*None*	*<None*	*>Unbound*
Installation and Maintenance	*None*	*None*	*None*	*>Unbound*

Description: Unbound = no commitment, >Unbound = mostly unbound with a limited number of commit-

[47] *EU-Korea (2010)*, Annex 7-A-1, pp. 1190-3.

[48] *EU-Korea (2010)*, Annex 7-A-2, pp. 1227-30.

[49] *EU-Korea (2010)*, Annex 7-A-3, pp. 1248-9.

[50] *US-Korea (2007)*, Annex II-United States-13.

ments, <None = mostly committed with a few reservations, None = full commitment, X = not mentioned. Grey = not identical with GATS commitments.

Professional services are considered with more attention in *US-Korea (2007)*, which provides for a separate Annex to the chapter on cross-border trade in services on professional services.[51] This Annex in particular encourages mutual recognition of standards, licenses and certificates. Efforts to establish mutual recognition procedures in particular shall focus on engineering services, architectural services, and veterinary services.[52] Mutual recognition primarily impacts on market access of mode 4 supply of professional services. Furthermore, commitments in professional services – as any other commitments in cross-border trade in services – are generally limited by the right to adopt or maintain measures not inconsistent with US commitments under GATS Art. XVI (Market Access).[53] The schedule of US-commitments under the GATS is for this purpose slightly amended, creating a minimum level of market access provided by *US-Korea (2007)*, which is slightly better than the one under GATS for some sectors and subsectors.

a) Engineering

From a preliminary analysis, EU liberalizing commitments in engineering services are equal to GATS commitments. No substantial additional or different commitments have been undertaken.

Liberalization in engineering services in the US market is primarily limited by national legislation on the state-level.[54] Mode 4 supply of engineering services is slightly more liberalized than under the GATS, by strengthening mutual recognition processes, and by limiting mode 4 supply only to the level of horizontal commitments.[55]

b) Architecture

From a preliminary analysis, EU liberalizing commitments in architecture services are equal to GATS commitments. No substantial additional or different commitments have been undertaken.

Liberalization in architectural services in the US market is primarily limited by national legislation on the state-level.[56] Mode 4 supply of engineering services is slightly more liberalized than under the GATS, by strengthening mutual recognition processes.

[51] *US-Korea (2007)*, Annex 12-A.

[52] *US-Korea (2007)*, Annex 12-A, Appendix 12-A-1

[53] *US-Korea (2007)*, Annex 2-United States-8.

[54] *US-Korea (2007)*, Annex I-United States-13ff.

[55] *US-Korea (2007)*, Annex II-United States-11.

[56] *US-Korea (2007)*, Annex I-United States-13ff.

c) Leasing

With respect to leasing services, *EU-Korea (2010)* actually provides for less market access in mode 1 supply of services than the EU does under the GATS (GATS-). This is slightly balanced by broader access with respect to a larger number leasing sectors[57] included in the schedule and with respect to mode 4 supply of services.

Leasing services are basically not mentioned in *US-Korea (2007)*, which suggests that the level of liberalization is substantially equal to GATS-levels.

d) Consultancy

From a preliminary analysis, EU liberalizing commitments in consultancy services are equal to GATS commitments. No substantial additional or different commitments have been undertaken.

Consultancy services are basically not mentioned in *US-Korea (2007)*, which suggests that the level of liberalization is substantially equal to GATS-levels.

e) Technical Testing

EU-Korea (2010) shows a different pattern of liberalizing commitment in technical testing services than EU GATS commitments: while commitments are less in modes 1 and 2 supply of services, they are more in modes 3 and 4 supply of services.

Technical testing is generally substantially liberalized with GATS+ commitments in mode 4 supply in services.[58]

f) Accounting and Auditing

From a preliminary analysis, EU liberalizing commitments in accounting and auditing services are equal to GATS commitments. No substantial additional or different commitments have been undertaken.

Accounting and auditing services in the US market are primarily limited by national legislation on the state-level.[59] Mode 3 and mode 4 supply of accounting and auditing services are slightly more liberalized than under the GATS, by slightly limiting reservations.[60]

g) Installation and Maintenance

Surprisingly, commitments in installation and maintenance services in non-transportation sectors in the *EU-Korea (2010)* PTA are less compared to levels of liberalizing commitments under the GATS (GATS-). However, *EU-Korea (2010)* extends commitments in installation and maintenance services to a larger number of sectors than

[57] Additional sectors include leasing relating to personal and household goods, and leasing relating to telecommunications equipment.

[58] *US-Korea (2007)*, Annex II-United States-11.

[59] *US-Korea (2007)*, Annex I-United States-13ff.

[60] *US-Korea (2007)*, Annex II-United States-11.

under GATS, including in particular maintenance and installation services related to transportation.

Generally, installation and maintenance are substantially liberalized by *US-Korea (2007)*. In particular maintenance is, however, limited depending on the particular context in which maintenance services are provided.[61]

4. Distribution Services

In *EU-Korea (2010)* distribution services are not considered with a separate section in the main treaty text. Commitments and regulation are to be found in the general section on trade in services, and in the Schedule of commitments. The qualitative analysis of levels of EU-commitments in distribution services is, thus, primarily based on the commitments entered in the Schedule of commitments. The two tables below illustrate the preliminary analysis of EU-commitments in the sub-sectors of interest in *EU-Korea (2010)* with the EU-commitments under GATS:

Sub-sector *EU-Korea (2010)*	**Mode 1**	**Mode 2**	**Mode 3**	**Mode 4**
Retail	>Unbound	Unbound	>Unbound	<None
Commissioning	>Unbound	Unbound	None	X
Wholesale Services	>Unbound	Unbound	<None	X
Logistics	>Unbound	Unbound	<None	X

Sub-sector EU GATS	***Mode 1***	***Mode 2***	***Mode 3***	***Mode 4***
Retail	*>Unbound*	*None*	*>Unbound*	*>Unbound*
Commissioning	*>Unbound*	*None*	*None*	*>Unbound*
Wholesale Services	*>Unbound*	*None*	*<None*	*>Unbound*
Logistics	*>Unbound*	*Unbound*	*<None*	*>Unbound*

Description: Unbound = no commitment, >Unbound = mostly unbound with a limited number of commitments, <None = mostly committed with a few reservations, None = full commitment, X = not mentioned. Grey = not identical with GATS commitments.

The focus of liberalizing commitments and regulation in distribution services in *US-Korea (2007)* is linked to the distribution of audio-visual services and telecommunication services mainly.[62] Otherwise, distribution services are not considered with special attention neither in the main treaty text, nor in the Annexes. Furthermore, commitments in distribution services – as any other commitments in cross-border trade in services – are generally limited by the right to adopt or maintain measures not inconsistent with US commitments under GATS Art. XVI (Market Access).[63] Given, however, that distribution services are already fully liberalized under the GATS, market access is likely going to be equal to GATS-levels in *US-Korea (2007)* in any case.

[61] E.g. limitations in the context of maritime transportation: *US-Korea (2007)*, Annex II-United States-5.

[62] See e.g. *US-Korea (2007)*, Annex II-United States-12.

[63] *US-Korea (2007)*, Annex 2-United States-8.

a) Retail

EU-Korea (2010) provides overall for less market access than GATS commitments do: in particular mode 2 supply of services is fully liberalized under the GATS, while it is not liberalized in *EU-Korea (2010)*.

Retail is not mentioned once in the context of cross-border trade in services in *US-Korea (2007)*, suggesting, thus, full liberalization.

b) Commissioning

EU-Korea (2010) provides overall for less market access than GATS commitments do: in particular mode 2 supply of services is fully liberalized under the GATS, while it is not liberalized in *EU-Korea (2010)*.

Commissioning is not mentioned once in the context of cross-border trade in services in *US-Korea (2007)*, suggesting, thus, full liberalization.

c) Wholesale Services

EU-Korea (2010) provides overall for less market access than GATS commitments do: in particular mode 2 supply of services is fully liberalized under the GATS, while it is not liberalized in *EU-Korea (2010)*.

Wholesale services are not mentioned once in the context of cross-border trade in services in *US-Korea (2007)*, suggesting, thus, full liberalization.

d) Logistics

Logistics relevant services in distribution are more or less equally liberalized under the GATS as in *EU-Korea (2010)*.

In *US-Korea (2007)*, generally, limitations to the liberalization of logistics related services seems to be less than under the GATS and mainly related to mode 4 supply.

5. Tourism Services

In *EU-Korea (2010)* distribution services are not considered with a separate section in the main treaty text. Commitments and regulation are to be found in the general section on trade in services, and in the Schedule of commitments. The qualitative analysis of levels of EU-commitments in tourism services is, thus, primarily based on the commitments entered in the Schedule of commitments. The two tables below illustrate the preliminary analysis of EU-commitments in the sub-sectors of interest in *EU-Korea (2010)* with the EU-commitments under GATS:

Sub-sector EU-Korea (2010)	**Mode 1**	**Mode 2**	**Mode 3**	**Mode 4**
Travel	>Unbound	None	*<None*	<None

Sub-sector EU GATS	***Mode 1***	***Mode 2***	***Mode 3***	***Mode 4***
Travel	*None*	*None*	*<None*	*<Unbound*

Description: Unbound = no commitment, >Unbound = mostly unbound with a limited number of commit-

ments, <None = mostly committed with a few reservations, None = full commitment, X = not mentioned. Grey = not identical with GATS commitments.

Tourism services fall under the general scope of application of the chapter on cross-border trade in services of the *US-Korea (2010)*. Except for indicating that there are no additional limitations scheduled based on state-level national legislation in the US,[64] tourism related services are not mentioned separately in *US-Korea (2007)*. Furthermore, commitments in tourism services – as any other commitments in cross-border trade in services – are generally limited by the right to adopt or maintain measures not inconsistent with US commitments under GATS Art. XVI (Market Access).[65] The schedule of US-commitments under the GATS is for this purpose slightly amended, creating a minimum level of market access provided by *US-Korea (2007)*, which is slightly better than the one under GATS for some sectors and sub-sectors.

a) Travel

With respect to mode 4 supply of travel services in tourism, *EU-Korea (2010)* provides for slightly more market access than the GATS. Otherwise, commitments are identical.

No limitations to travel services are mentioned in the context of cross-border trade in services in *US-Korea (2007)*, suggesting, thus, liberalization equal to GATS-levels.

6. Expected Sectorial Implications of T-TIP based on Case Study

From the analysis of EU commitments in *EU-Korea (2010)* in the sectors of interest, it is relatively safe to say, that in these sectors no substantial liberalization is to be expected. While it is likely that a number of additional sub-sectors are added to the services chapter in the T-TIP, the EU shows little interest in substantially liberalizing all the services trade in said sectors. Arguably, this is unlikely to change during negotiations of the T-TIP. These findings are furthermore in line with the database of MARCHETTI AND ROY (2008), which already indicated that the EU is generally less open to substantial trade liberalization in services in PTAs, compared with the GATS, with a history of generally modest commitments.

The most remarkable differences in the Schedule of commitments in *EU-Korea (2010)* compared to the GATS are to be found in professional services and in distribution services. Modest GATS-minus commitments in sub-sectors in professional services (leasing, technical testing and installation and maintenance) are balanced with additional sub-sectors added to *EU-Korea (2010)* as compared to the GATS Schedule. Distribution services, however, are generally more restricted under *EU-Korea (2010)* than under the GATS, in particular with respect to mode 2 supply of services.

The analysis of the commitments of the EU under GATS and in *EU-Korea (2010)* has shown in some sub-sectors so-called GATS-minus commitments. Given that the affected sub-sectors are of particular interest for Switzerland, this information is surprising and

[64] *US-Korea (2007)*, Annex I-United States-14.

[65] *US-Korea (2007)*, Annex 2-United States-8.

important: GATS-minus commitments in PTAs have often been observed (e.g. Adlung and Miroudot 2012). While it remains unclear, what the legal and political purpose of these commitments is, their existence implies that in practice, the level of GATS-minus commitments prevails. Switzerland may therefore be advised to clarify trade relations in services with the EU in a PTA in services. However, as economic analysis shows, the services industry of Switzerland is today much more integrated into the EU services market than EU commitments under the GATS would imply. (See the gravity analysis that follows below). Arguably, this is a consequence of the economic and political integration in other policy areas, based on bilateral treaties and other agreements between the EU and Switzerland. Thus, an agreement on services trade integration between the EU and Switzerland would have to at least bind the current state of practice, in order to be of interest for Switzerland. Additional political and legal certainty together with market integration, may, nevertheless, contribute to long-term stability of EU-Swiss services trade relations, and further increase Swiss services trade exports to the EU (Again see the gravity analysis that follows).

With a few exceptions listed in the Annex II-United States-11ff. generally, *US-Korea (2007)* reserves the right to provide only for GATS levels of liberalization in cross-border trade in services. The protection of liberalizing commitments – except for market access improvements listed in said Annex II – is, therefore relatively weak. Most prominent GATS+ commitments are to be found in engineering and architectural services by increasing market access in modes 1-3 supply of services, as well as in mode 4 supply, in addition to strengthening mutual recognition processes. Furthermore, financial services were of particular concern in *US-Korea (2007)* and attributed with extensive regulation, a high number of limitations to liberalizing commitments, and a limited scope of application. Even though the database of MARCHETTI AND ROY (2008) suggests, that the US tends to go substantially beyond GATS-levels of commitments in transportation services, this seems not to be the case in *US-Korea (2007)*: transportation services clearly play a subordinate role in this agreement.

Assuming that the T-TIP may establish mutual recognition processes in professional services between the US and the EU, Swiss providers of professional services may face considerably more competition on the US market in the future.

This analysis indicates one thing above all: liberalizing commitments in trade in services in the T-TIP are not going to be based on a pre-existing blue print. The regulatory structure as well as the extent of liberalizing commitments in US and EU PTAs in trade in services is not identical, in some service sectors not even similar. Negotiations will, thus, likely be challenging, and the outcome remains unpredictable. Furthermore, both the US and the EU have shown to adapt regulation and level of liberalization to their respective partners in a PTA. This will in particular be true for the T-TIP, given that both the US and the EU have not yet concluded a comparable PTA.

D. Gravity Analysis of Services Trade and FDI

So far the discussion has been focused on the features of existing agreements. In this section we supplement the qualitative analysis of existing agreements with a more quantitative analysis based on gravity modelling of trade in services, and of the interaction between services trade and policy affecting FDI within Europe and North America. The basic approach is based on gravity modelling, combined with measures of NTBs affecting services.

A large literature in empirical international economics assesses the consequences of preferential trade agreements and bilateral regimes for goods trade using gravity models (see Baier and Bergstrand, 2007, 2009; Egger, Egger, and Greenaway, 2008; Egger and Wamser, 2013). This literature considers binary indicator variables that are unity whenever two countries participate in the same preferential trade agreement (in a given year) and zero otherwise. Typically, all trade agreements are pooled so that average effects are estimated across all existing agreements (see Soloaga and Winters, 2001, for an exception, considering effects of individual agreements, and Francois and Woerz 2009 for agreement implementation over time). While preferential tariff reductions are a key feature (though not the only one) of goods trade agreements, services trade agreements mainly involve a harmonization of standards, establish transparency about rules, and facilitate market access without affecting the taxation of cross-border services transactions. In any case, the deeper goods trade agreements – most notably the EU, EFTA, and NAFTA agreements -- also facilitate services trade, while pure services trade agreements are rare (see also Egger and Wamser, 2013).

1. Estimating Framework

We discuss in this sub-section our basic gravity-modelling framework. The reader can skip this section and move to discussion of results, if desired.

Modern trade theory suggests a mathematical representation of bilateral trade (aggregate or sector-level) between source country *j* and destination country *i* of the following form

$$V_{i,j} = A_i T_{i,j} B_j$$

$$B_j = E_j \Big/ \sum_k A_k T_{ki}$$

where V_{ij} is the value of bilateral trade (of services), A_i are source (exporter)-specific factors (productivity, price-cost markup, factor costs in efficiency units, mass of firms, etc.), T_{ij} are effects of (inverse) policy or natural trade frictions, and B_j are importer-specific factors (total expenditures on all services or sector-specific services denoted by

E_j, the price index in country j which is a function of $\sum_k A_k T_{ki}$). Log-transformation and using lower-case letters for variables in logs leads to

$$v_{i,j} = a_i + t_{i,j} + b_j$$

While country-specific factors a_i and b_j are often captured by country-specific constants, as will be done here, t_{ij} is of interest, since it permits gauging the direct effects of trade frictions for cross-border trade. It is customary to assume a log-additive structure about t_{ij} as a function of observable variables capturing policy and natural trade costs (or trade facilitations):

$$t_{i,j} = b\left(\sum\nolimits_h \alpha_h t_{h,i,j}\right) = \sum\nolimits_h g_h t_{h,i,j}$$

where t_{hij} are observable measures of trade costs in logs (e.g., log bilateral distance between i and j or binary indicators for trade agreement membership, adjacency, colonial relationships between i and j, etc.), b is the so-called direct elasticity of (services) trade with respect to trade costs, and a_h is the direct elasticity or semi-elasticity of ad-valorem trade costs $(t_{ij})^{-b}$ with respect to the h-th measurable trade cost variable t_{hij}. Unlike with goods trade, where ad-valorem trade cost measures are available through tariffs so that b can be estimated as a parameter on the log of one-plus-the-tariff-rate, b and a_h can typically not estimated separately so that what are identifiable as parameters on observable trade costs are $g_h = b\alpha_h$. (see Egger, Larch, and Staub, 2012, and Francois and Hoekman 2010, for tricks to identify b with services trade). In what follows, we will delve into this background in the empirical specification and the interpretation of parameters. Agreements that are specific to services are rare (see also Egger and Wamser, 2013), though recently, existing agreements are being revisited to add services chapters.

2. Data

We utilize data on bilateral imports of services of up to 214 exporting and importing countries for the year 2007. The source of the services data is a just updated version of the Trade in Services Database (TSD) from Francois and Pindyuk (2010). For aggregate services in recent years, non-missing data on imports are available for up to 10,183 of the potential 214*213=45.582 pairs. We do not set the missing observations to zero, since the data principally permit distinguishing zero flows from missing flows. In 2007, for example, of the 10,183 pairs with identified (non-missing) services import flows, 2,294 (or about 22%) report zero aggregate bilateral flows

We consider aggregate services trade (EBOBS category 200) as well as services trade in commercial services excluding transport (EBOPS category 981). For an econometric analysis, we specify aggregate as well as specific bilateral services imports as a log-additive (or exponentially-multiplicative) function of a complete set of not further specified exporter-specific and importer-specific factors as discussed above (representing a_i and b_j) as well as a host of preferential and natural trade cost factors. Most of the latter

are represented by binary indicator variables so that the parameters on them (referred to as g_h above) represent direct semi-elasticities. When we examine foreign affiliates trade (the activities of MNEs) we also

We work with data for 2007-2009. Table IV.1 provides descriptive statistics for one of these years, 2007, for aggregate bilateral services trade flows (the dependent variable), policy trade costs, and natural trade cost variables. What should be noted is that services trade is available for some tiny countries which we will suppress from the empirical analysis so that the number of observations will be less than 10,183 even for aggregate services trade. Moreover, there are more missing data for one-digit EBOPS category-specific services trade data so that the number of observations will eventually be much smaller than 10,183 when we look at commercial services. In any case, we will always report the number of country-pairs (observations) and the number of exporting and importing countries behind it.

Based on the existing literature, for the natural trade cost variables, we also include data on natural barriers found to affect bilateral goods trade in previous research. These are: Log (bilateral) distance; Adjacency; Common official language; Colonial relationships; Common colonizer; Recent colonial relationships; and Same country.

Table IV.1 - Descriptive statistics

Dependent variable	Type	Mean	Std.dev.	Minimum	Maximum
Indicator variable for positive bilateral imports	binary	0.779	0.415	0	1
Log bilateral imports	continuous	9.497	3.262	-6.908	21.147
Explanatory policy variables					
Intra-EU	binary	0.069	0.253	0	1
Intra-EFTA	binary	0.001	0.024	0	1
EU-with-EFTA	binary	0.016	0.124	0	1
Intra-NAFTA	binary	0.001	0.024	0	1
Explanatory natural trade cost variables					
Log distance	continuous	8.539	0.856	4.088	9.883
Adjacency	binary	0.019	0.137	0	1
Common official language	binary	0.091	0.288	0	1
Colonial relationships	binary	0.041	0.197	0	1
Common colonizer	binary	0.032	0.175	0	1
Recent colonial relationships	binary	0.028	0.166	0	1
Same country	binary	0.007	0.085	0	1

3. Services Market Access in the EU

Our first set of regressions (see Table 2) reflects a search for evidence that intra-EU trade, of intra-EFTA trade, is higher than trade between third countries. This would serve as evidence that trade costs for services are effectively reduced within Europe. It would also point to a preferential position for Swiss firms under the status quo that might be eroded with T-TIP.

To quantify the potential for preference erosion for Swiss firms under T-TIP, we focus on here on regression results preferences extended among EU member countries ("Intra-EU"), ones extended among EFTA member countries ("Intra-EFTA"), ones extended between EU and EFTA member countries ("EU-with-EFTA"), and ones extended between NAFTA member countries ("Intra-NAFTA"). Country-pairs outside of those agreements reflect the base category. To the extent that the mentioned agreements facilitate services trade relative to the benchmark country-pairs, we expect the coefficients on the binary agreement indicators to be positive. However, not all of the agreements facilitate all kinds of services trade in the same way, so that we would neither expect positive nor identical coefficients for all services categories. For example, EFTA does not have a formal services agreement with the EU, but through various agreements within the EEA framework there are features that may matter for services trade, such as regulatory cooperation and cooperation on competition policy and procurement.

Table IV.2 - Determinants of bilateral general services imports

(Poisson pseudo-maximum likelihood estimates w/ robust standard errors for 2007-2009)

	All services (EBOPS 200)			Commercial services, excl. transport (EBOPS 981		
Explanatory variable	Coef.	Std. err.		Coef.	Std. err.	
Intra-EU	1.390	0.187	***	1.243	0.280	***
Intra-EFTA	0.638	0.370	*	0.501	0.555	
EU-with-EFTA	0.672	0.126	***	0.602	0.189	***
Intra-NAFTA	-0.165	0.104		-0.084	0.120	
Log distance	-0.473	0.026	***	-0.479	0.055	***
Adjacency	0.251	0.050	***	0.101	0.074	
Common official language	0.213	0.056	***	0.144	0.078	*
Colonial relationships	0.169	0.066	***	0.017	0.074	
Common colonizer	0.048	0.098		0.531	0.269	**
Recent colonial relationships	0.483	0.087	***	0.312	0.221	
Same country	0.710	0.077	***	0.391	0.112	***
Observations (country pairs)	18617			9123		
Exporters	211			60		
Importers	211			60		
Correlation coefficient of model with data	0.929			0.928		
Fixed exporter and importer effects	Yes			Yes		

Table IV.2 summarizes the respective coefficient estimates and provides some further information when using aggregate bilateral services trade (EBOPS 200) and other (non-business) services trade (EBOPS 981) as the dependent variables. Apart from the number of observations, we always report the number of importing and exporting countries involved as well as a correlation coefficient between the estimated model (the prediction) and the data on services trade. The latter should be viewed as substituting information for the unavailable R^2 for nonlinear (e.g., generalized linear or exponential-family-type) models.

In the subsequent discussion, we will largely focus on the direct semi-elasticities on the (preferential) policy trade cost variables. However, we should note that other trade costs have largely the same qualitative effects on services trade than on goods trade (services trade declines with cultural, economic, institutional, or historical distance). That geography plays a role for services trade is not novel an insight though interesting,

since the transportation in a narrow sense of many services over longer distances is not costly.

Regarding the policy barriers, we find big and statistically significant effects of EU membership and of market access facilitation between the EU and EFTA countries. The coefficients suggest that an EU membership is worth a direct effect of 100·exp(1.39-1)=148% more services trade with other EU members relative to outsiders. An EFTA membership is worth 72.0% more trade with EU member countries. What this means for Switzerland is that Swiss trade is, on average, 72% higher with EU Member States than with third countries, once we control for country characteristics and natural trade costs. Interestingly, the advantage of an EFTA membership for aggregate services trade flows mainly from facilitated market access with EU countries. Interestingly, we find no evidence for a similar effect between NAFTA countries. This raises an interesting question. If the US gains access under similar conditions to EFTA Members trading with the EU in services, there is scope for substantial preference erosion (loss of competitive advantage) for Swiss firms. If instead the result is closer to what we see in NAFTA, there may be little effect. Indeed, the CGE assessment here (based on the DG Trade assessment by ECORYS 2013) assumes something in the middle, with partial liberalization between both markets. This implies there will be some erosion of competitive position in the European market for Swiss firms. As noted earlier in our discussion of trade and production patterns, the EU market is by far the more important of the two for Switzerland.

Total services trade includes transport, which is logically affected by higher trade volumes within trade agreements. Table IV.2 also, therefore, reports results for commercial services, excluding transport. Here, we see a similar effect within the EU. The intra-EU coefficient translates to 127 percent more trade between EU Members than with third countries. The EU trade with EFTA coefficient is also similar for commercial services, implying 67 percent more trade in commercial services between EU Member States and EFTA Members than between either of these and third countries. As such, even excluding transport services, the basic message is that there is scope for erosion of relative market access conditions for Swiss firms in the European market, if there is actual reduction in EU-US trade costs in services. The evidence from EU-EFTA flows implies that, indeed, there is scope within regional agreements for substantially increased service trade flows, though NAFTA does offer a counterpoint – there is also scope for little identifiable increase in service flows.

4. FDI and Market Access

We next extend our basic gravity framework to examine interactions between policy regulating FDI and observed trade flows. From the OECD (2010) we have regulatory restriction indexes specific to FDI in services. These indexes cover selected years spanning 1997-2010. We work with the 2006 indexes here. They provide scores for fully

open regimes (index=0) and fully closed regimes (index=1). They cover goods and services sectors for OECD Members and 10 additional countries, and we have mapped them here to our total services (EBOPS 200) and commercial services (EBOPS 981) categories. We transform these indexes to a variable lnDEX=ln(1+OECD index) for inclusion in our regressions. In principal, these measure average or MFN (non-discriminatory) regulatory barriers. The MFN value of these measures should be picked up in destination country fixed effects (dummy variables). However, to the extent there is a preference margin, or reduced NTBs for FDI within regional agreements, we will estimate this by interacting the NTB index variable with the regional agreement variable. If regional agreements are discriminatory in a regulatory sense, and reduce NTBs for FDI relative to the baseline of MFN rate, this means we should have a positive coefficient on this interaction term.

Table IV.3 - Services trade and FDI restriction

	All services (EBOPS 200)			Commercial services, excl. transport (EBOPS 981)		
Explanatory variable	Coef.	Std. err.		Coef.	Std. err.	
Intra-EU	0.808	0.239	***	0.623	0.349	*
Intra-EFTA	-2.400	0.530		0.435	0.838	
EU-with-EFTA	0.478	0.180	***	0.465	0.259	*
Intra-NAFTA	-0.314	0.209		-0.253	0.209	
Intra-EU_FDI_NTB	8.509	1.702	***	9.381	2.505	***
Intra-EFTA_FDI_NTB	7.050	2.521	***	0.043	4.794	
EU-with-EFTA_FDI_NTB	1.807	1.129	*	0.806	1.494	
Intra-NAFTA_FDI_NTB	0.720	1.153		0.537	1.147	
Log distance	-0.480	0.026	***	-0.506	0.053	***
Adjacency	0.260	0.050	***	0.121	0.073	*
Common official language	0.227	0.056	***	0.154	0.080	*
Colonial relationships	0.147	0.066	***	-0.027	0.074	
Common colonizer	0.043	0.100		0.585	0.312	*
Recent colonial relationships	0.506	0.087	***	0.304	0.221	
Same country	0.722	0.075	***	0.423	0.107	***
Observations (country pairs)	17,762			8481		
Exporters	210			59		
Importers	207			56		
Correlation coefficient of model with data	0.931			0.928		
Fixed exporter and importer effects	Yes			Yes		

(Poisson pseudo-maximum likelihood estimates w/ robust standard errors for 2007-2009)

Table IV.3 summarizes our estimates, inclusive of the measure of restrictions on FDI. For both total services and commercial services, the fit of the model is comparable to Table IV.2. What is important is that for intra-EU trade, and also for EU trade with EFTA, the NTB levels seems to matter. The intra-EU coefficient for commercial services, for

example, implies that for commercial services, will have 100·exp(.623-1)=68.6% more trade even where there are no FDI restrictions vis-à-vis EU or third countries. The coefficient on the intra-EE NTB index tells us that for each one percent increase in the NTB index, we will have an 8.5 percent increase in trade with EU Members relative to third countries. This suggests that the EU has been effective in limiting, within the single market, the impact of FDI regulatory barriers on services trade between Member States. Critically for the present discussion, we find that even in regimes without NTB restrictions on FDI in services, Switzerland enjoys 100·exp(.478-1)=58.6% more trade with EU Members than with third countries in services. Where there are barriers in place, we see 1.8 percent more trade for each one percent increase in NTBs as measured by our FDI restriction index. We interpret these results to mean that part of the market access benefit of EFTA arrangements with the EU follow from trade cost reduction, while the impact of restrictions on foreign investment are somewhat limited for EFTA countries vis-à-vis the EU. However, this is far smaller than for intra-EU trade and investment linkages, implying that in terms of investment based regulatory barriers, Switzerland has a competitive advantage vis-à-vis US firms at the moment in Europe, but a disadvantage vis-à-vis European firms operating within the single market. As in the case of direct services trade discussed above, the results in Table 3 suggest scope for erosion on the competitive position of Swiss firms operating in the EU following from reduction in barriers that impact on the foreign presence of firms in Europe.

Nontariff Barriers to Trade and the Activity of Multinational Firms

In this next section we examine the potential for T-TIP to impact on FDI, as manifested in the number of firms engaged in FDI, the revenues of those firms, and the number of local employees in those firms.

Theoretical background for the analysis

The theory of multinational firms formulates two main arguments for why running subsidiaries abroad may be beneficial to firms relative to engaging in trade (only). One is the advantage of being proximate to consumers relative to concentrating production activities at the site of the headquarters, giving rise to so-called horizontal multinational firms that produce identical products at home and abroad. The other ones is the advantage of being proximate to (more productive or cheaper) production factors and resources which are relevant to particular production stages which leads to a strong separation of different slices of the production process across sites (affiliates) and, at least, a geographical separation of headquarters services and goods or other services production (see Markusen, 2002).

Among factors determining production costs themselves and supply as well as demand potential in different markets, trade costs – of the natural and the policy type – affect the decision to go multinational and whether to integrate horizontally or vertically (see Markusen, 2002; Barba Navaretti and Venables, 2004; Bergstrand and Egger, 2007). In this part of the project we pay particular attention to two policy variables that might be

relevant in this context: non-tariff barriers to trade and the participation in preferential trade agreements that extend preferential access to goods, services and investment markets.

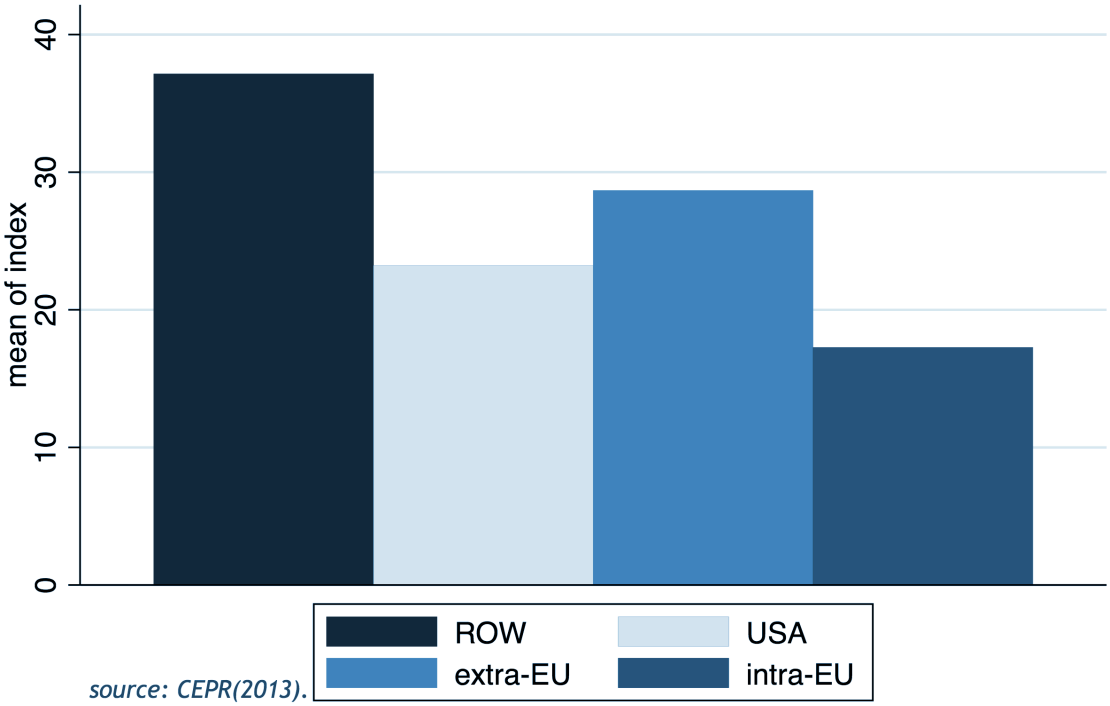
In what follows, we describe the data and econometric framework used for this analysis, and we summarize the main findings.

Data

We utilize data on the bilateral activity of multinational firms of 28 developed home countries in 69 developed and developing host countries in the average year between 2007 and 2009. The activity of multinational firms is captured by three measures which we alternatively use as dependent variables in the econometrics analysis: the number of enterprises per home and host country; the number of employees per home and host country; and the amount of turnover (foreign affiliate sales) per home and host country. The source of the multinational firm data is Eurostat. We have merged these data with information on three policy variables: the extent of usage of nontariff barriers for a host country against a home country (based on survey data from ECORYS 2009 and summarized in Figure 1); a binary indicator variable which is unity if both the host and the home country are members of the EU27; and a measure of the depth of trade agreements which is positive for dyads where a trade agreement is in place and takes higher integer values (in the data, up to five) for deeper trade agreements (based on DESTA dataset collected and made available by Dür et al 2014).

Moreover, we add measures of trade and investment costs, which are log bilateral distance between a home and a host country and three binary indicator variables: one for land adjacency, one for common ethnological language, and one for colonial relationships. Finally, we add home and host country log GDP as two separate measures of market size (measuring, inter alia, supply potential of multinational firm activity and demand potential for multinational firm activity). The GDP data are taken from the World Bank's World Development Indicators.

Figure IV.1: Usage of nontariff barriers for a host country against a home country



source: CEPR(2013).

source:See text. Extra-EU(Intra-EU) refers to NTMs faced by non-EU(EU) firms operating in EU.

After dropping observations with missing data on multinational firm activity and non-tariff barrier use, there are between 1,512 and 1,391 observations on aggregate country-pairwise multinational firm activity (depending on the actual measure thereof) that the regressions can be based upon. Table IV.4 provides descriptive statistics (mean, standard deviation, minimum, and maximum) for all dependent and explanatory variables used.

Table IV.4

Dependent variable	Type	Mean	Std.dev.	Minimum	Maximum
Number of enterprises of home in host country	continuous	51	186.730	0	3661
Employment of home in host country	continuous	6100	22800.180	0	332941
Turnover of home in host country	continuous	1437	5773.588	0	87118
Explanatory policy variables					
Fraction of non-tariff barrier measures	binary	0.365	0.211	0.050	1
Intra-EU	binary	0.353	0.478	0	1
Depth of trade agreement measure	binary	1.813	2.400	0	5
Explanatory natural trade cost variables					
Log distance	continuous	8.386	1.236	4.088	10.055
Adcacency	binary	0.037	0.188	0	1
Common official language	binary	0.043	0.202	0	1
Colonial relationships	binary	0.032	0.175	0	1
Log home country GDP	continuous	5.254	1.496	2.088	7.947
Log host country GDP	continuous	5.164	1.491	1.483	8.463

Regression analysis

For the econometric modelling of the dependent variables reflecting multinational firm activity, we generally resort to generalized linear models. These models avoid a possible bias from modelling the disturbances inappropriately in log-additive versus level additive (see Santos Silva and Tenreyro, 2006, and Egger and Staub, 2014; see Egger, 2010, for an application of such models to foreign direct investment). Denoting multinational firm activity of home country i in host country j by F_{ij} and its determinants levels and logs by H_{ij} and h_{ij}, respectively, the general structure underlying the econometric models in the present analysis is

$$F_{ij} = \exp(h_{ij}b)h_{ij},$$

where h_{ij} is a mean-unity disturbance term, which is bounded from below by zero and has infinite positive support. The distributional assumptions about the error terms depend on the particular functional form of the generalized linear model in place. We consider three alternative generalized linear models, one based on the Poisson pseudo-likelihood, one based on the Gamma pseudo-likelihood, and one based on the Negative binomial model pseudo-likelihood. Notice that, as demonstrated in Egger and Staub (2014) the latter model is not generally prone to the problem of a lack of invariance to the scaling of the dependent variables, unlike as stated in Head and Mayer (2014). A comparison of the models is based on two criteria: the fit of the data and the Akaike information criterion.

We present the regression results based on the aforementioned data and econometric models in Tables III. 5-7. Table IV.5 contains the findings for the number of foreign-owned firms as the dependent variable, Table IV.6 uses the number of employees, and Table IV.7 employs turnover (foreign-affiliate sales). Every table is organized in two vertical blocs and three horizontal ones. The vertical blocs differ in terms of the specification of the right-hand-side (the columns of h_{ij}): whereas the upper bloc uses an intra-EU binary indicator variable, the one employs the categorical variable reflecting depth of trade agreements. Hence, the former assumes that intra-EU relationships stand out in terms of the degree of integration while all other preferential agreements are similar to not having any agreement at all. The latter (using the depth-of-agreements) variable assumes that all preferential agreements (rather than only the EU) matter, and they affect foreign direct investment differently depending on their depth. The horizontal organization of the tables corresponds to the assumptions about the distribution of the error term, h_{ij}.

Table IV.5 Generalized Linear Regression Results – number of firms

Explanatory variable	Coef.	Std. err.		Coef.	Std. err.		Coef.	Std. err.	
Log distance	-0.491	0.060	***	-0.729	0.097	***	-0.662	0.080	***
Adcacency	0.523	0.144	***	0.791	0.322	**	0.842	0.277	**
Common official language	-0.094	0.154		-0.545	0.302	*	-0.084	0.190	
Colonial relationships	0.891	0.174	***	1.577	0.292	***	1.193	0.190	***
Fraction of non-tariff barrier measures	-1.638	0.365	***	-3.748	0.400	***	-2.953	0.353	***
Intra-EU	0.026	0.138		0.164	0.234		-0.068	0.219	
Log home country GDP	0.978	0.038	***	1.071	0.051	***	0.976	0.048	***
Log host country GDP	0.502	0.032	***	0.352	0.060	***	0.361	0.050	***
Constant	-0.888	0.675		1.938	0.878	**	1.695	0.886	*
Other information									
Observations	1512			1512			1512		
Generalized linear model type	Poisson			Gamma			Negative binomial		
Correlation coefficient of model with data	0.854			0.666			0.689		
Akaike	42.474			6.089			6.694		
Explanatory variable	Coef.	Std. err.		Coef.	Std. err.		Coef.	Std. err.	
Log distance	-0.477	0.066	***	-0.737	0.101	***	-0.678	0.087	***
Adcacency	0.523	0.144	***	0.768	0.319	**	0.827	0.273	***
Common official language	-0.086	0.156		-0.543	0.301	*	-0.088	0.191	
Colonial relationships	0.902	0.172	***	1.578	0.291	***	1.192	0.191	***
Fraction of non-tariff barrier measures	-1.629	0.370	***	-3.778	0.403	***	-2.987	0.353	***
Depth of trade agreement measure	0.015	0.029		0.022	0.047		-0.026	0.046	
Log home country GDP	0.977	0.038	***	1.069	0.051	***	0.977	0.049	***
Log host country GDP	0.500	0.032	***	0.350	0.060	***	0.363	0.050	***
Constant	-1.011	0.733		2.046	0.918	**	1.850	0.939	**
Other information									
Observations	1512			1512			1512		
Generalized linear model type	Poisson			Gamma			Negative binomial		
Correlation coefficient of model with data	0.854			0.666			0.689		
Akaike	42.451			6.091			6.693		

Table IV.6 Generalized Linear Regression Results – number of employees

Explanatory variable	Coef.	Std. err.		Coef.	Std. err.		Coef.	Std. err.	
Log distance	-0.387	0.063	***	-0.793	0.110	***	-0.778	0.107	***
Adcacency	0.437	0.196	**	0.671	0.296	**	0.693	0.287	**
Common official language	-0.221	0.179		-0.282	0.436		-0.169	0.387	
Colonial relationships	1.322	0.173	***	2.170	0.491	***	2.019	0.430	***
Fraction of non-tariff barrier measures	0.005	0.361		-3.176	0.610	***	-2.797	0.568	***
Intra-EU	-0.204	0.154		-0.538	0.276	*	-0.559	0.265	**
Log home country GDP	1.152	0.050	***	1.266	0.079	***	1.251	0.077	***
Log host country GDP	0.666	0.048	***	0.698	0.072	***	0.670	0.068	***
Constant	0.437	0.702		3.986	0.971	***	3.969	0.949	***
Other information									
Observations	1437			1437			1437		
Generalized linear model type	Poisson			Gamma			Negative binomial		
Correlation coefficient of model with data	0.794			0.518			0.522		
Akaike	6035.718			14.846			14.912		
Explanatory variable	Coef.	Std. err.		Coef.	Std. err.		Coef.	Std. err.	
Log distance	-0.378	0.068	***	-0.818	0.113	***	-0.807	0.111	***
Adcacency	0.432	0.196	**	0.672	0.286	**	0.694	0.277	**
Common official language	-0.230	0.183		-0.261	0.437		-0.149	0.390	
Colonial relationships	1.334	0.176	***	2.139	0.489	***	1.990	0.429	***
Fraction of non-tariff barrier measures	-0.051	0.359		-3.250	0.611	***	-2.868	0.569	***
Depth of trade agreement measure	-0.032	0.034		-0.125	0.057	**	-0.130	0.055	**
Log home country GDP	1.151	0.050	***	1.270	0.079	***	1.255	0.077	***
Log host country GDP	0.659	0.047	***	0.696	0.073	***	0.670	0.068	***
Constant	0.416	0.741		4.252	1.003	***	4.252	0.985	***
Other information									
Observations	1437			1437			1437		
Generalized linear model type	Poisson			Gamma			Negative binomial		
Correlation coefficient of model with data	0.794			0.511			0.514		
Akaike	6048.366			14.834			14.900		

Comparing the econometric models across all tables, Poisson seems to work best in terms of the explanatory power. Since this is true for all of the considered dependent variables, we favor Poisson pseudo-maximum likelihood-based results over the other ones. Since there is not much difference between the models in the upper and the lower vertical bloc in each table and it seems plausible to consider other preferential agreements beyond the EU of having some effect on foreign direct investment, we base our interpretation on the results in the bloc in the lower-left corner of each table.

The results broadly suggest that inverse distance (geographical neighbourliness) and land adjacency robustly raise economic foreign firms' activity between two countries and so do home and host country economic size. The other non-policy trade cost variables have a less robust impact. More and/or stronger non-tariff barriers appear to robustly reduce the number of firms active and their turnover, while there is no clear-cut evidence for an impact on foreign employment. Deeper trade agreements appear to stimulate foreign activity of any kind.

Interpretation

The regression results reported here provide some indication of the possible impact of a T-TIP agreement on relative FDI positions, both for the US and EU directly, and also for Switzerland. A one-percentage point increase in the fraction of non-tariff barrier measures reduces the number of firms active by about 1.6 percent and foreign affiliate sales by about 1.4 percent. An increase in the depth of trade agreements by one degree (on a scale from zero to five, where zero measures and absence of any preferential trade agreement) raises the number of foreign-owned firms active by about 1.6 percent and foreign turnover by about 7.2 percent.

In general, based on the parameter estimates, the scope of stimulating foreign firm activity by reducing non-tariff measures specific to FDI directly is as important as extending deeper preferential market access. In the case of the US and EU, however, as both are relatively open, NTBs facing FDI directly are relatively low. (Again see Figure 1). Based on these results, the strongest effects on FDI are estimated to follow not from the trade-related aspects of T-TIP. Rather they would follow from FDI-specific provisions of the agreement. Trade related aspects of T-TIP, based on our estimates, imply an increase in the European revenues of US MNEs of roughly 35 percent (assuming a deep agreement scaled on the DESTA scale). From the ECORYS FDI NTB data, a partial reduction of 10 points in the 100 point NTB scale facing US and EU NTBs affecting FDI (for example from closing half the market access gap facing non-European firms in the EU) implies an additional 14 percent increase in revenue of US firms operating in the EU. Together, these estimates suggest, roughly speaking, an approximate increase in US MNE revenues in the EU of 49 percent. This points to a strong increase in competitive pressure facing Swiss firms from US firms operating in the EU. At the same time, Swiss participation in T-TIP could also provide a substantial boost to Swiss firms operating in the US, with similar expansion (perhaps 50%) in US-based revenues for Swiss firms being a reasonable expectation.

E. Summary and Conclusion

Assessing the potential implications of services trade liberalization and mutual recognition in services related activities under a future T-TIP is difficult at this stage: as main parameters are not yet available, it does not go beyond guessing. The comparison of commitments in the EU Korean and the US Korean Agreement with US and EU GATS levels shows that levels of additional commitments made in services have generally been modest. At the same time, the actual pattern of trade in services in Europe, and the impact of FDI related regulatory barriers, points to scope for potentially large changes in the competitive structure of European service markets vis-à-vis US firms.

Drawing implications from the general levels of additional commitments made by the EU and the US in PTAs, it is interesting to make the following observations: Commitments in financial services made do not exist on the part of the EU, and are modest by the US. Lit-

tle can be learned here for T-TIP. The same holds true for professional services, with an emphasis, however, of the US on mutual recognition processes. Distribution services are slightly improved by the EU (may, however, in particular cases also be GATS-minus, see *EU-Korea (2010)*), but already fully liberalized by the US in GATS. The main increases in relation to GATS are to be expected in the field of transportation services. It will therefore be necessary to further study the implications for Swiss transportation and logistical services, taking into account existing Swiss EU and Swiss US Agreements in air transportation. Given low levels of additional commitments expected for transportation, it is safe to say that commitments in T-TIP cannot build upon an acquis developed and agreed upon in existing more recent PTAs. They are likely to be discussed taking into account the particularities of the transatlantic relations. It is impossible to make reliable predictions at this time.

The scenarios sketched out for different services sector identify main challenges in the field of financial services. Any privileged market access mutually granted between the US and the EU will increase US competition for Swiss companies in the EU market, and render operations more difficult in the US. While the latter may no longer be a main practical interest following the financial crisis of 2007 to 2012, market access within the EU remains of paramount importance. Apart from existing disciplines under GATS, Switzerland remains unprotected against any privileges mutually accorded by the US and the EU in the field of services. It remains a fact that Switzerland does not dispose of a preferential general agreement on trade in services with the EU that could offset by means of non-discrimination privileges mutually granted by the US and the EU. While such an agreement may not have been necessary due to liberal market access in most countries, T-TIP may change conditions, as it will enhance US competition on European markets for Swiss service providers. This conclusion is supported by the gravity analysis.

The prospects of T-TIP therefore reinforce the point that Switzerland cannot solely rely upon current WTO commitments and levels of liberalization, while hoping for MFN based outcomes of EU-US results in the TISA negotiations. An enhanced agreement of some kind on services (even perhaps TiSA for example) might effectively counterbalance the negative impact of T-TIP market integration for Swiss service providers on the EU market. From the gravity analysis, Switzerland at the moment is half-way between third countries and EU Member States when it comes to access to the EU market. This points to potential scope for improved access conditions even with respect to the EU.[66]

[66] As an aside, the fact that regional agreements do not seem to depart meaningfully from GATS itself implies that a completed TiSA that is built around the services features of recent RTAs might not actually change the competitive playing field, in terms of market access in services. For the TiSA to have impact, just like the T-TIP it would need to go past models we have seen so far.

V. Impact of Procurement Liberalization on Switzerland

A. Introduction

The EU, US and Switzerland are all Contracting Parties to the Uruguay Round Agreement on Government Procurement (URGPA) and the Revised GPA (RGPA).

While the EU and Switzerland have liberalized federal (Annex 1), sub-federal (Annex 2) and procurement undertaken by utilities[67] (Annex 3) in their commitments under the URGPA and the RGPA, the US has only undertaken major commitments on federal procurement[68]. In addition, each country has its list of derogations (both plurilateral and reciprocal) under these agreements. For instance, in the case of the EU, the following is not open to suppliers and service providers of the USA: sub-federal procurement, procurement by drinking water and urban transport utilities, and Annex 3 procurement of dredging services and that related to shipbuilding, air traffic control equipment and airport facilities. While the EU and Switzerland have a positive list approach to the procurement liberalization of services (see Tables II.1 and III.2 for sector coverage), the US follows a negative list approach (and has excluded from coverage all transportation, dredging, public utilities (including telecom), R&D and printing services; the last only for Annex 2 entities). Finally, the coverage of services (including construction services) procurement by both countries is strictly on a reciprocal basis.

Switzerland too has not extended the benefits of this Agreement to US suppliers and service providers of (i) public utilities (water, airports, and urban transport) and (ii) air traffic control equipment. As in the case of the EU, Swiss coverage of services (including construction services) procurement in the WTO agreements is also strictly on a reciprocal basis.

Finally, procurement undertaken by small and medium enterprises is outside the scope of the WTO agreements in all three countries[69].

The tables on EU and Swiss services coverage in the URGPA show that both have an equivalent list of covered services. The objective of this symmetric coverage was, for both Parties, to achieve strict reciprocity and assure effective market access opportunities in the procurements of services. In addition to the WTO's GPA, the EU and Switzerland also have a bilateral agreement on procurement that was signed in 1999 and en-

[67] Annex 3 procurement by utilities exposed to competitive market forces is excluded from coverage.
[68] Though significant derogations from coverage remain in Annex 1 procurement even in the RGPA.
[69] Switzerland estimated that set asides for SMEs - as foreseen in the schedules of the US, Japan, Korea and partially Canada - have a discriminatory effect and could be bad references for acceding Parties and should therefore be, whenever possible, eliminated during the revision of the GPA as expected in the in-built mandate of the URGPA. Since this was not possible to achieve, Switzerland proposed to address the issue through a strong work program on SMEs. This method has been adopted in Article XXII: 8 of the RGPA, with work expected to start in June 2014.

tered into effect in 2002. This bilateral agreement goes beyond the scope of the WTO agreements, covering procurement by regions and municipalities[70], public and private companies in the sectors of rail transport, gas and heating supply, "as well as procurement by private companies which, on the basis of special or exclusive rights transferred to them by a public authority or legislation, are active in the sectors of drinking water, electricity supply, urban transport, airports, as well as river and sea transport."

Table V.1: The EU's services coverage under the RGPA

Subject	**CPC Reference No.**
Maintenance and repair services	6112, 6122, 633, 886
Land transport services, including armoured car services, and courier services, except transport of mail	712 (except 71235), 7512, 87304
Air transport services of passengers and freight, except transport of mail	73 (except 7321)
Transport of mail by land, except rail, and by air	71235, 7321
Telecommunications services	752
Financial services	ex 81
(a) Insurance services	812, 814
(b) Banking and investments services***	
Computer and related services	84
Accounting, auditing and bookkeeping services	862
Market research and public opinion polling services	864
Management consulting services and related services	865, 866****
Architectural services; engineering services and integrated engineering services, urban planning and landscape architectural services; related scientific and technical consulting services; technical testing and analysis services	867
Advertising services	871
Building-cleaning services and property management services	874, 82201 to 82206
Publishing and printing services on a fee or contract basis	88442
Sewage and refuse disposal; sanitation and similar services	94

[70] This is a significant extension of scope as procurement by municipalities accounts for the largest share of Swiss public procurement.

Table V.2: Swiss services coverage under the RGPA

Object	Reference Numbers CPC
Maintenance and repair services	6112 , 6122 , 633 , 886
Hotel and other lodging services analogue	641
Catering and beverage sales eat-in	642, 643
Ground transportation services, including	712 (except 71235)
services armored car services	7512, 87304
mail, except transport of mail	
Air transport services: passenger	73 (except 7321)
and freight, except transport of mail	
Transport of mail by land transport	71235 , 7321
(excluding rail transport services) and air	
Travel agency services and organizers	7471
tourist	
Telecommunications services	752
Financial Services:	Part 81
a) Insurance services	812 , 814
b) Banking and investment services*	
Real estate services on a fee or contract basis	822
Services lease or lease machinery	
and equipment without operator	83106-83109
Services lease or lease items	
personal and domestic part	832
Computer and related services	84
Consulting services in the field of law of the country of origin of	861
and public international law	
Accounting , auditing and bookkeeping	862
Tax advisory services	863
Market research and public opinion polling services	864
Services management consultancy and related services	865 866 **
Architectural , engineering and services	867
integrated engineering services; urban planning and	
landscape architecture ; related services	
scientific and technical consulting , testing services	
and technical analyzes	
Advertising services	871
Services Building-cleaning services and management	874, 82201-82206
properties	
Packaging services	876
Services and related consulting forestry of	8814
Publishing services and printing on the basis of	88442
fee or contract basis	
Services Sewage and refuse disposal services	94
sanitation and similar services	

Both the WTO agreements and the EU-Switzerland bilateral agreement mandate that only public contracts above a certain minimum threshold be subject to internationally competitive bidding. Thresholds differ depending on the type of procurement and on the level of government making the purchase. For central government entities of all three countries, the threshold values are SDR 130,000 for procurement of goods and services and SDR 5 million for procurement of construction services. For sub-central government

entities, the EU and Swiss thresholds are SDR 200,000 for goods and services, while the US applies an SDR 355,000 threshold; the threshold is SDR 5 million for construction services. For utilities, the threshold values are SDR 400,000 for goods and services procurement in all three countries (with the exception that the United States also applies a USD 250,000 threshold for federally owned utilities) and SDR 5 million for construction services. In the EU-Switzerland bilateral agreement, the threshold for building contracts is SDR 5 million, for goods and services SDR 130,000 (Confederation) and for municipalities and cantons SDR 200,000. These thresholds are thus coherent with those in the URGPA.

The EU and US are likely to negotiate reciprocal liberalization of areas and sectors that they have chosen not to commit to in the WTO agreements. This means that the EU would like the US to include coverage of federal procurement in sectors currently excluded in the RGPA, significantly liberalize its sub-federal procurement and include coverage of transportation, dredging, public utilities (including telecom), R&D and printing services to European suppliers and service providers. The US in turn would press the EU to liberalize its sub-federal procurement, procurement by drinking water and urban transport utilities, and Annex 3 procurement of dredging services and that related to shipbuilding, air traffic control equipment and airport facilities, all of which are currently closed to US suppliers and service providers.

Sub-federal procurement is likely to be a major issue in the TTIP negotiations as only 37 US States are covered under the RGPA and even within these, there are derogations from coverage (details provided in Table 3). In addition, procurement of construction-grade steel, motor vehicles and coal is excluded from coverage under the RGPA for the US states of Delaware, Florida, Illinois, Iowa, Maine, Maryland, Michigan, New Hampshire, New York, Oklahoma, Pennsylvania and Wyoming. Significantly, local content requirements in US sub-federal procurement of steel have been reported as a barrier (ID 960100, status on-going) in the EU's market access database: "Steel is subject to the imposition of local content requirements or preferences given in works and other government procurement contracts for bids which include locally produced steel. This practice is notably common at the sub-federal level. Many States (such as Connecticut, Louisiana, Maine, Michigan, Illinois, Maryland, New York, Pennsylvania, Rhode Island and West Virginia) have such requirements that also apply to private contractors and subcontractors." Incidentally, West Virginia is one of the remaining 13 states whose procurement has been excluded by the US from GPA coverage.

The EU would therefore like the US to extend its coverage of states (including Georgia, which is a major public spender that the US declined to include from coverage in the RGPA,) include sectors currently excluded from its WTO commitments and remove local content requirements in sub-federal procurement of steel. The thresholds for sub-federal procurement are also much higher in the US (SDR 355,000) compared to the EU (SDR

200,000) and the EU would also like parity on this issue. The EU may also like more contestability in the transfer of funds from Annex 1 to Annex 2 entities in the US.

It may also be useful to point out that where the commitments of Switzerland are addressed, the URGPA and the RGPA do not foresee a condition of reciprocity in terms of quantitative market (for e.g. Switzerland has liberalized access to the procurements of all its 26 cantons even when the US only offers 37 out of 50 States). The rebalancing of these kinds of gaps has been achieved through other instruments of reciprocity achievement, such as restricted access to challenge procedures (only over the threshold of US 355'000, no challenge admission for SMEs from US, etc.).

Table V.3: US sub-federal procurement not covered under the RGPA

State	Sector
Arkansas	Construction services
Hawaii	Software, construction services
Kansas	Construction services, automobiles, aircraft
Kentucky	Construction projects
Mississippi	All services
Montana	All goods
New York	Procurement by public authorities and public benefit corporations/transit cars, buses and related equipment
Oklahoma	Construction services
Rhode Island	Boats, automobiles, buses and related equipment
South Dakota	Beef
Tennessee	Services, construction services
Washington	Fuel, paper products, boats, ships, vessels

The EU-Swiss bilateral agreement also covers procurement by private companies with exclusive rights or public mandate. The US may press the EU for similar treatment in this regard. Both countries may also push for procurement by municipalities to be covered under the TTIP, as in the EU-Swiss bilateral agreement. The EU would also like to revisit the Buy American provisions in the America Recovery and Reinvestment Act (ARRA) of 2009, to the extent that the implementation of these provisions has been detrimental to the interests of EU suppliers and service providers. Finally, both countries may negotiate in the TTIP to eliminate "other" restrictions on market access in the RGPA such as set asides for SMEs, which are transparent in the US but not in the EU.

Successful negotiations on these issues in the TTIP would enhance market contestability on either side that may have adverse implications for Switzerland. An ex-ante examination of these issues requires the use of credible data on purchases made by these three governments from each other's suppliers and service providers.

Article XIX: 5 of the URGPA and Article XVI: 4 of the RGPA require that all Contracting Parties submit procurement data to the WTO Committee on Government Procurement. While not all Contracting Parties have complied with this requirement over time, fortunately we have some data availability for the EU, US and Switzerland, albeit with limitations. For instance, Switzerland has made detailed submissions to the WTO over 1990-2003 with some gaps but none beyond 2003[71]. The EU does not include data on foreign procurement disaggregated by sector in its submissions. The US does not provide any data on foreign procurement at all in its submissions. Despite these limitations, country submissions to the WTO are the "best" source of internationally comparable data on government procurement and will thus form the basis of analysis in the following sections.

The EU and the US have been the most important foreign suppliers of procurement contracts to Swiss governments, accounting for 66 and 12% respectively of total Swiss foreign procurement over 1990-2003 (Shingal, 2012b). On the other hand, despite the bilateral Swiss-EU procurement agreement, while Switzerland was the second most important foreign supplier to EU governments in 2007, its share in EU's total foreign procurement was only 8.3% compared to the US's 72.4%. Thus, any procurement liberalization in the TTIP is likely to further consolidate the US's role as a foreign supplier in EU public markets at the expense of Switzerland. It may also make US public markets more attractive to EU suppliers.

The analysis that follows thus first identifies goods and services sectors important for the bilateral award of procurement contracts amongst these three countries using procurement data submitted by these countries to the WTO and using the methodology developed in Shingal (2012a) to estimate market access in sectors where such data have not been submitted. We then consider the impact of the likely liberalization of EU-US procurement markets in the TTIP on Switzerland.

The latest year for which the EU has made detailed procurement submissions to the WTO is 2007. We shall therefore also use this year to compare US procurement patterns. On the other hand, the year of analysis in the case of Switzerland is 2012, though these data have not yet been submitted to the WTO.

B. EU procurement

In 2007, total EU procurement by all forms of government was €2,088 bn of which €293.5 bn (14.1%) was awarded above-threshold (AT) and covered by the GPA (this value was 2.18% of the EU's GDP in that year). The EU provides another estimate of total procurement covered by the GPA in its submissions to the WTO; this value is €309.6 bn, which is 14.8% of EU's total procurement and 2.5% of the EU's GDP in 2007. Unfortunately, it was not possible to clarify why the EU provides two estimates. For practical

[71] In this report, we use data for the year 2012 which are yet to be submitted to the WTO.

purposes, one could use an average of these two figures, which is what we do in our own analysis.

The breakdown of GPA-covered above-threshold ("AT") procurement by Annexes[72] was €91 bn by Annex 1 entities, €150 bn by Annex 2 entities and €52.3 bn by Annex 3 entities. Thus, Annex 2 is the most important procuring level for the EU accounting for 51% of GPA-covered AT procurement across the three Annexes followed by Annex 1 (31% of AT procurement covered by the GPA).

In terms of the sector composition of procurement reported in Table V.4 below, the EU's public purchases were concentrated in the following sectors[73]:

- Sectors 45 (construction), 72 (computer-related) & 74 (other business services "OBS") accounted for 61% of total AT Annex 1 procurement covered by the GPA.

- Sectors 24 (chemicals), 45 (construction), 66 (post & telecom) & 74 (OBS) accounted for 62.4% of total AT Annex 2 procurement covered by the GPA.

- Sectors 28 (fabricated products), 35 (transport equipment), 40 (utilities) and 45 (construction) accounted for 70% of total AT Annex 3 procurement covered by the GPA.

[72] For the EU, federal level procurement is that undertaken by Central governments of the Member States; sub-federal procurement is that by regional and local authorities and bodies governed by public law.
[73] The sector classifications are provided in each Member country's submissions to the WTO.

Table V.4: Breakdown of EU's GPA-covered AT procurement by Annex & sectors (2007)

Sector descriptions	GPA covered AT procurement (€ mn)				Shares (%) per annex				Shares (%) per sector			
	Annex 1	Annex 2	Annex 3	Total	Annex 1	Annex 2	Annex 3	Total	Annex 1	Annex 2	Annex 3	Total
Agriculture	1.8	80.8	0.0	82.5	0.0	0.1	0.0	0.0	2.1	97.9	0.0	100.0
Forestry	1.5	32.3	7.3	41.1	0.0	0.0	0.0	0.0	3.7	78.6	17.7	100.0
Fishing	0.4	8.8	0.0	9.2	0.0	0.0	0.0	0.0	4.3	95.7	0.0	100.0
Coal	13.0	22.6	45.1	80.7	0.0	0.0	0.1	0.0	16.1	28.0	55.9	100.0
Petrol, natural gas	1109.5	209.9	74.8	1394.2	1.2	0.1	0.1	0.5	79.6	15.1	5.4	100.0
Uranium	88.6	21.9	0.4	111.0	0.1	0.0	0.0	0.0	79.9	19.7	0.4	100.0
Metal ores	0.2	0.6	0.9	1.7	0.0	0.0	0.0	0.0	11.6	34.8	53.6	100.0
Mining & quarrying	70.1	358.1	36.6	464.8	0.1	0.2	0.1	0.2	15.1	77.1	7.9	100.0
Food & beverage	762.2	1975.5	8.7	2746.3	0.8	1.3	0.0	0.9	27.8	71.9	0.3	100.0
Tobacco	1.5	8.5	0.1	10.0	0.0	0.0	0.0	0.0	14.6	84.6	0.9	100.0
Textiles	158.3	244.1	0.8	403.2	0.2	0.2	0.0	0.1	39.3	60.5	0.2	100.0
Clothing & footwear	1784.5	967.4	14.6	2766.5	2.0	0.6	0.0	0.9	64.5	35.0	0.5	100.0
Leather	83.4	63.9	0.6	147.9	0.1	0.0	0.0	0.1	56.4	43.2	0.4	100.0
Wood	25.5	96.2	20.3	142.0	0.0	0.1	0.0	0.0	18.0	67.7	14.3	100.0
Pulp & paper	165.5	348.5	13.3	527.3	0.2	0.2	0.0	0.2	31.4	66.1	2.5	100.0
Printing	238.6	580.7	56.8	876.1	0.3	0.4	0.1	0.3	27.2	66.3	6.5	100.0
Petroleum & fuels	1088.6	1469.0	771.7	3329.3	1.2	1.0	1.5	1.1	32.7	44.1	23.2	100.0
Chemicals	3160.6	11938.4	162.0	15261.0	3.5	8.0	0.3	5.2	20.7	78.2	1.1	100.0
Rubber & plastic	184.8	375.5	98.2	658.6	0.2	0.3	0.2	0.2	28.1	57.0	14.9	100.0
Non-metallic minerals	5.7	74.6	25.4	105.7	0.0	0.0	0.0	0.0	5.4	70.6	24.0	100.0
Basic metals	131.9	149.9	277.4	559.3	0.1	0.1	0.5	0.2	23.6	26.8	49.6	100.0
Fabricated products	561.7	1804.5	6077.8	8444.0	0.6	1.2	11.6	2.9	6.7	21.4	72.0	100.0
Machinery	2331.7	1692.5	2458.8	6483.1	2.6	1.1	4.7	2.2	36.0	26.1	37.9	100.0
Office & computing machinery	4131.6	2547.2	544.7	7223.4	4.5	1.7	1.0	2.5	57.2	35.3	7.5	100.0
Electrical machinery	331.1	1450.8	1966.5	3748.4	0.4	1.0	3.8	1.3	8.8	38.7	52.5	100.0

Radio, TV, telecom	1204.8	1637.6	118.1	2960.5	1.3	1.1	0.2	1.0	40.7	55.3	4.0	100.0
Medical & precision	2383.3	8361.3	320.4	11065.1	2.6	5.6	0.6	3.8	21.5	75.6	2.9	100.0
Motor vehicles	1323.6	1884.7	835.5	4043.8	1.5	1.3	1.6	1.4	32.7	46.6	20.7	100.0
Transport equipment	1750.6	600.2	4642.3	6993.1	1.9	0.4	8.9	2.4	25.0	8.6	66.4	100.0
Manufactured goods, furniture	309.3	1007.8	258.6	1575.7	0.3	0.7	0.5	0.5	19.6	64.0	16.4	100.0
Recovered secondary raw materials	10.0	2.9	0.4	13.3	0.0	0.0	0.0	0.0	74.9	22.1	3.0	100.0
Utilities	1056.9	2925.1	9966.7	13948.8	1.2	1.9	19.0	4.8	7.6	21.0	71.5	100.0
Collected and purified water	1.7	319.5	6.0	327.2	0.0	0.2	0.0	0.1	0.5	97.7	1.8	100.0
Construction	19144.6	56362.8	16170.3	91677.7	21.0	37.6	30.9	31.2	20.9	61.5	17.6	100.0
Repair & maintenance	2809.4	4756.5	3144.2	10710.1	3.1	3.2	6.0	3.6	26.2	44.4	29.4	100.0
Installation svs	6.9	82.9	0.0	89.8	0.0	0.1	0.0	0.0	7.7	92.3	0.0	100.0
Land transport svs	427.3	3828.9	551.1	4807.4	0.5	2.6	1.1	1.6	8.9	79.6	11.5	100.0
Air transport svs	387.7	152.8	9.7	550.2	0.4	0.1	0.0	0.2	70.5	27.8	1.8	100.0
Postal and telecom svs	1289.4	1592.8	31.2	2913.5	1.4	1.1	0.1	1.0	44.3	54.7	1.1	100.0
Insurance and pension funding svs	943.4	12182.7	655.9	13781.9	1.0	8.1	1.3	4.7	6.8	88.4	4.8	100.0
Services auxiliary to financial intermediation	2452.9	1741.5	56.7	4251.2	2.7	1.2	0.1	1.4	57.7	41.0	1.3	100.0
Real estate svs	19.2	381.0	29.4	429.6	0.0	0.3	0.1	0.1	4.5	88.7	6.9	100.0
Computer and related svs	30644.0	2585.2	429.9	33659.1	33.6	1.7	0.8	11.5	91.0	7.7	1.3	100.0
Architectural, construction, legal, accounting and business svs	6068.3	13108.0	802.0	19978.3	6.7	8.7	1.5	6.8	30.4	65.6	4.0	100.0
Printing, publishing and related svs	1040.4	292.5	9.8	1342.6	1.1	0.2	0.0	0.5	77.5	21.8	0.7	100.0
Sewage, sanitation and environmental svs	374.5	6811.7	1304.9	8491.1	0.4	4.5	2.5	2.9	4.4	80.2	15.4	100.0
Miscellaneous	991.4	2918.8	346.6	4256.8	1.1	1.9	0.7	1.5	23.3	68.6	8.1	100.0
Total	**91071.9**	**150059.3**	**52352.8**	**293484.1**	**100.0**	**100.0**	**100.0**	**100.0**	**31.0**	**51.1**	**17.8**	**100.0**

As shown in Table V.5 below, *de facto* market access provided to foreign firms in 2007 was 3.6-4.4% of the EU's total AT procurement (this translates into €11 - 13 bn). Once again, the EU reports two estimates (indicated by I and II in the table below) in its submissions to the WTO. Unfortunately and as mentioned above, it was not possible to clarify why the EU provides two estimates and as a workable proposition, we use an average of these two figures in our analysis. The US accounted for more than 70% of the EU's foreign procurement (henceforth "FP"), followed by Switzerland (8.3%), Canada (7.2%), Japan (7%) and Norway (4.3%).

Table V.5: Breakdown of the EU's foreign procurement by nationality of winning supplier (2007)

(Value in €'000)	ESTIMATED TOTAL I	ESTIMATED TOTAL II	Number of contracts	Share of total FP by value I (%)	Share of total FP by value II (%)
CANADA	805,962	926,146	105	7.3	7.1
CHINESE TAIPEI	615	615	1	0	0
HONG KONG, CHINA	44,680	44,680	2	0.4	0.3
ICELAND	9,878	11,737	29	0.1	0.1
ISRAEL	30,714	38,530	68	0.3	0.3
JAPAN	774,019	913,223	1,247	7	7
KOREA	-	-	-	0	0
LIECHTENSTEIN	1,380	1,430	5	0	0
NORWAY	373,710	674,481	47	3.4	5.2
NL AS ARUBA*	-	-	-	0	0
SINGAPORE	-	-	-	0	0
SWITZERLAND	902,267	1,092,872	1,333	8.2	8.4
UNITED STATES	8,102,804	9,254,724	11,691	73.4	71.4
Total	**11,046,029**	**12,958,438**	**14,528**	**100**	**100**

Source: EU submissions to the WTO; own analysis.

Note: I and II correspond to the two estimates of FP provided by the EU in its data submissions to the WTO. All the countries in this table are GPA-Members.

Unfortunately, information enabling a more disaggregated analysis of the EU's FP by sector is not available in the EU's submissions. We therefore provide estimates for this using GTAP, UN Comtrade, OECD and IMF BOP data on the basis of the methodology from Shingal (2012a) described in the Appendix.

C. US procurement

In the case of the US, the most complete data is available for Annex 1 purchases only.

Annex 1 procurement

In 2007, total procurement by US Annex 1 entities was USD 767.8 bn (€ 590.6 bn) of which 99% was awarded above-threshold (AT) (this amounted to 5.4% of US GDP in 2007). However, its submissions also indicate that 20.4% (€ 119 bn) of this Annex 1 AT procurement was awarded under derogations to the GPA. This suggests that only 79.85% (€ 471.6 bn) of its total reported procurement was covered by the rules of the GPA. Like Anderson et.al. 2011 (p. 18), we take the data submissions to the WTO at "face value" when we report this high *de jure* market access figure.

In terms of broad disaggregates reported in Table V.6 below, 69% of total AT contracts by value were goods and non-construction services while the remaining 31% were construction services. In terms of number of contracts awarded, 95.6% of total AT contracts were goods and non-construction services. This also means that construction services contracts awarded by US Annex 1 entities were mostly large-value contracts.

Table V.6: Snapshot of US Annex 1 procurement (2007)

(Values in €bn)	Above Threshold (value)	Below Threshold (value)	Total	Above Threshold (number)	Average value per contract (€ mn)
Good and services	403	3.5	406.5	12,766	31.6
Construction services	182	2.1	184.1	591	307.8
Total	**585**	**5.6**	**590.6**	**13,357.0**	**43.8**

Source: US submissions to the WTO; own analysis.

Unfortunately, the submitted data cannot be disaggregated by sector or by the nationality of the winning supplier. Given the absence of this information in the data submitted to the WTO, these breakdowns are provided using GTAP, UN Comtrade, OECD and IMF BOP data based on the methodology from Shingal (2012a) outlined in the Appendix.

Annex 2 procurement

Total Annex 2 procurement by US sub-federal governments in 2007 amounted to USD 539 bn (€ 414.6 bn), which was 3.8% of US GDP in that year. The

bulk of this procurement was in education (72.8%) followed by health (15.1%) and highways (14.4%). The states of California (14.4% of total Annex 2 procurement), New York (11.9%), Texas (8%), Pennsylvania (6.2%) and Illinois (4.7%) were the largest purchasers. Unfortunately, submitted data does not tell us how much of this procurement was "put" AT or supplied by foreign firms.

Annex 3 procurement

Total US Annex 3 procurement in 2007 amounted to USD 10 bn (€ 7.7 bn), which was 0.07% of US GDP. At least 28.1% of this procured value was reported to be AT.[74] Unfortunately, submitted data does not tell us whether the remaining procurement was contestable[75].

D. Swiss procurement

Swiss submissions to the WTO only cover procurement undertaken by the federal government. The total value of this procurement reported to be above GPA-specified thresholds in the year 2012 was €2.26 bn. Appendix Tables E.1 and E.2 report the value and number of contracts awarded AT disaggregated by sector and nationality of the winning supplier, respectively.

As Table E.1 shows, 23.7% of total AT procurement by value and 24% by number was awarded in the goods sectors; 38.6 and 50.9%, respectively in services and the rest in construction services. Procurement demand was found to be high (at least 5% of total AT procurement value) in the following sectors: engineering services (CPV code 71300000), software services (CPV code 72260000) and construction work (CPV code 45000000).

Table E.2 reveals that 91% of all contracts by value and 89% by number were awarded to Swiss suppliers only. The EU was the only other major supplier accounting for 8% of total procurement by value and number.

Table E.2 also shows that the Swiss federal government purchased several goods and services from EU suppliers and service providers in 2012. On the other hand, US interests in Swiss public markets were significant in only two sectors – computer equipment (CPV code 30200000) and business and management consultancy services (CPV code 79410000). These data also suggest that EU and US suppliers may not be competing for Swiss procurement contracts in the same sector.

[74] An exact number cannot be provided because not all entities report their procurement as above & below threshold in the US submissions.
[75] The term contestable refers to public procurement which is likely to be above GPA-set thresholds and hence, subject to internationally competitive bidding.

E. Estimates of market access in partner procurement markets

The data reported to the WTO do not inform us on the sectors important for EU and Swiss suppliers in US procurement markets or for US and Swiss suppliers in EU procurement markets. We thus use the methodology from Shingal (2012a), described in the Appendix, to get a sense of the major public demand sectors in each case.

The estimates of the EU's access in US procurement markets using this methodology are reported in Table 8. These estimates suggest EU market access of €169.4 mn in the US federal government market, of €49.1 mn at the sub-federal level and €0.9 mn in procurement undertaken by utilities[76]. In terms of sectoral interests in TTIP, the important sectors in the US procurement markets from the perspective of the EU's access are other commercial services (OCS[77]), transport services, government services (OSG), chemicals-rubber-plastics and food-beverages-tobacco (these sectors accounted for at least 5% of the EU's total access in the US procurement markets at each level).

Note that the US has excluded all transportation services from coverage in its WTO commitments. The EU could thus potentially gain up to €28.9 mn, €8.4 mn and €156000, respectively, from successful preferential liberalization in the TTIP of the US's federal, sub-federal and utilities procurement of transportation services.

[76] In the absence of complete information in US WTO-submissions on contestable expenses at the sub-federal level and for utilities, these estimates assume that one-third of total government expenditure is contestable in each case.

[77] OCS is a broad category that includes communication, construction, computer and information, financial, insurance, other business services as well as royalties and license fees.

Table V.8: Estimates of the EU's access in US procurement markets (€ '000s)

Sectors	Federal	Shares (%)	Sub-federal	Shares (%)	Utilities	Shares (%)
Agriculture forests fishery	765.2	0.5	222.0	0.5	4.1	0.5
Mining and energy extraction	0.0	0.0	0.0	0.0	0.0	0.0
Food beverages tobacco	*9783.2*	*5.8*	*2838.3*	*5.8*	*52.7*	*5.8*
Textiles	1227.7	0.7	356.2	0.7	6.6	0.7
Wearing apparel	81.5	0.0	23.6	0.0	0.4	0.0
Leather products	237.8	0.1	69.0	0.1	1.3	0.1
Wood products	9.2	0.0	2.7	0.0	0.0	0.0
Paper products, publishing	2697.9	1.6	782.7	1.6	14.5	1.6
Petroleum, coal products	5.7	0.0	1.6	0.0	0.0	0.0
Chemical, rubber, plastic	*14213.8*	*8.4*	*4123.6*	*8.4*	*76.6*	*8.4*
Mineral products nec	287.3	0.2	83.3	0.2	1.5	0.2
Ferrous metals	342.5	0.2	99.4	0.2	1.8	0.2
Metals nec	0.0	0.0	0.0	0.0	0.0	0.0
Metal products	310.6	0.2	90.1	0.2	1.7	0.2
Motor vehicles and parts	5287.2	3.1	1533.9	3.1	28.5	3.1
Transport equipment nec	92.1	0.1	26.7	0.1	0.5	0.1
Electronic equipment	2199.5	1.3	638.1	1.3	11.9	1.3
Machinery and equipment nec	1519.4	0.9	440.8	0.9	8.2	0.9
Manufactures nec	2790.2	1.6	809.5	1.6	15.0	1.6
Electricity	0.0	0.0	0.0	0.0	0.0	0.0
Gas manufacture, distribution	0.0	0.0	0.0	0.0	0.0	0.0
Transport svs	*28965.8*	*17.1*	*8403.4*	*17.1*	*156.1*	*17.1*
Other commercial svs (OCS)	*81133.5*	*47.9*	*23538.0*	*47.9*	*437.2*	*47.9*
Other govt svs (OSG)	*17479.6*	*10.3*	*5071.1*	*10.3*	*94.2*	*10.3*
Total	**169429.4**	**100.0**	**49153.9**	**100.0**	**912.9**	**100.0**

Source: UNSNA, GTAP, OECD, UN Comtrade, OECD Bilateral Trade in Services; own calculations.

Table 9 reports estimates of Swiss access in US procurement markets using the same methodology. These estimates suggest Swiss market access of €4.5 mn in the US federal government market, of €1.3 mn at the sub-federal level and €24,000 in procurement undertaken by utilities[78]. The important sectors in the US procurement markets from the perspective of Swiss suppliers are OCS and chemicals-rubber-plastics (these sectors accounted for at least 5% of total Swiss access in the US public markets at each level). Note that the US has excluded all transportation services from coverage in its WTO commitments.

[78] In the absence of complete information in US WTO-submissions on contestable expenses at the sub-federal level and for utilities, these estimates assume that one-third of total government expenditure is contestable in each case.

Table V.9: Estimates of Swiss access in US procurement markets (€ '000s)

Sectors	Federal	Shares (%)	Sub-federal	Shares (%)	Utilities	Shares (%)
Agriculture forests fishery	1.2	0.0	0.3	0.0	0.0	0.0
Mining and energy extraction		0.0		0.0		0.0
Food beverages tobacco	140.6	3.1	40.8	3.1	0.8	3.1
Textiles	37.8	0.8	11.0	0.8	0.2	0.8
Wearing apparel	5.6	0.1	1.6	0.1	0.0	0.1
Leather products	2.9	0.1	0.9	0.1	0.0	0.1
Wood products	0.1	0.0	0.0	0.0	0.0	0.0
Paper products, publishing	60.4	1.3	17.5	1.3	0.3	1.3
Petroleum, coal products	0.0	0.0	0.0	0.0	0.0	0.0
Chemical, rubber, plastic products	*1028.9*	*22.8*	*298.5*	*22.8*	*5.5*	*22.8*
Mineral products nec	6.3	0.1	1.8	0.1	0.0	0.1
Ferrous metals	3.8	0.1	1.1	0.1	0.0	0.1
Metals nec		0.0		0.0		0.0
Metal products	21.7	0.5	6.3	0.5	0.1	0.5
Motor vehicles and parts	15.2	0.3	4.4	0.3	0.1	0.3
Transport equipment nec	3.9	0.1	1.1	0.1	0.0	0.1
Electronic equipment	58.2	1.3	16.9	1.3	0.3	1.3
Machinery and equipment nec	135.9	3.0	39.4	3.0	0.7	3.0
Manufactures nec	348.4	7.7	101.1	7.7	1.9	7.7
Electricity		0.0		0.0		0.0
Gas manufacture, distribution		0.0		0.0		0.0
Transport svs						
Other commercial svs (OCS)	*2636.6*	*58.5*	*764.9*	*58.5*	*14.2*	*58.5*
Other govt svs (OSG)		0.0		0.0		0.0
Total	**4507.6**	**100.0**	**1307.7**	**100.0**	**24.3**	**100.0**

Source: UNSNA, GTAP, OECD, UN Comtrade, OECD Bilateral Trade in Services; own calculations.

Similarly, the estimates of the US's access in EU procurement markets are reported in Table V.10. Given the much larger size of EU procurement markets, these estimates suggest a much larger market access of € 2.6 bn in the EU's federal government market, of € 3.9 bn at the sub-federal level and € 3 bn in procurement undertaken by utilities. The important sectors in the EU from the perspective of US market access interests are transport equipment, OCS, chemicals-rubber-plastics, electronic equipment, machinery and equipment, motor vehicles and parts and metal products (for utilities procurement). Again, these sectors accounted for at least 5% of the US's total access in the EU procurement markets.

Note that the EU's sub-federal procurement market is currently not open to US suppliers and service providers. The US could thus potentially gain up to €3.89 bn from successful preferential liberalization of the EU's sub-federal procurement markets in the TTIP.

Table V.10: Estimates of the US's access in EU procurement markets (€ '000s)

Sectors	Federal	Shares (%)	Sub-federal	Shares (%)	Utilities	Shares (%)
Agriculture forests fishery	81.0	0.0	2701.1	0.1	161.4	0.0
Mining and energy extraction	159.1	0.0	76.1	0.0	19.6	0.0
Food beverages tobacco	9139.2	0.3	23744.8	0.6	104.7	0.0
Textiles	300.8	0.0	464.0	0.0	1.5	0.0
Wearing apparel	2087.1	0.1	1131.5	0.0	17.1	0.0
Leather products	211.0	0.0	161.6	0.0	1.4	0.0
Wood products	233.1	0.0	878.1	0.0	185.3	0.0
Paper products, publishing	18648.8	0.7	42874.3	1.1	3232.6	0.1
Petroleum, coal products	2330.0	0.1	3144.4	0.1	1651.9	0.1
Chemical, rubber, plastic	*469812.0*	*17.7*	*1729273.2*	*44.4*	36553.8	1.2
Mineral products nec	57.4	0.0	755.0	0.0	257.0	0.0
Ferrous metals	2269.0	0.1	2579.2	0.1	4772.3	0.2
Metals nec	0.0	0.0	0.0	0.0	0.0	0.0
Metal products	21100.2	0.8	67786.2	1.7	*228318.5*	*7.4*
Motor vehicles and parts	*154739.6*	*5.8*	*220329.7*	*5.7*	97678.3	3.2
Transport equipment nec	*779993.6*	*29.5*	*267410.2*	*6.9*	*2068355.8*	*67.1*
Electronic equipment	*296895.1*	*11.2*	*232823.8*	*6.0*	36879.9	1.2
Machinery and equipment	*221549.0*	*8.4*	*261529.5*	*6.7*	*368187.7*	*11.9*
Manufactures nec	23726.0	0.9	75099.3	1.9	19245.6	0.6
Electricity and gas	22.2	0.0	61.4	0.0	209.2	0.0
Transport svs	5638.7	0.2	27546.9	0.7	3879.8	0.1
Other commercial svs (OCS)	*638493.6*	*24.1*	*922634.1*	*23.7*	*211409.5*	*6.9*
Other govt svs (OSG)	569.1	0.0	10351.6	0.3	1983.1	0.1
Total	**2648055.6**	**100.0**	**3893355.9**	**100.0**	**3083106.0**	**100.0**

Source: UNSNA, GTAP, OECD, UN Comtrade, OECD Bilateral Trade in Services; own calculations.

Finally, Table 11 reports estimates of Swiss access in EU procurement markets using the same methodology. These estimates suggest Swiss market access of €386.5 mn in the EU's federal government market, of €789.6 mn at the sub-federal level and €482.4 mn in procurement undertaken by utilities. The important sectors in the EU from the perspective of Swiss suppliers and service providers are OCS, chemicals-rubber-plastics, machinery and equipment, transport equipment, electricity and gas and metal products (for procurement by Annex 3 entities). These sectors accounted for at least 5% of Swiss total access in the EU procurement markets.

Table V.11: Estimates of Swiss access in EU procurement markets (€ '000s)

Sectors	Federal	Shares (%)	Sub-federal	Shares (%)	Utilities	Shares (%)
Agriculture forests fishery	2.0	0.0	66.5	0.0	4.0	0.0
Mining and energy extraction	2.2	0.0	1.1	0.0	0.3	0.0
Food beverages tobacco	1557.8	0.4	4047.3	0.5	17.8	0.0
Textiles	191.1	0.0	294.8	0.0	1.0	0.0
Wearing apparel	2133.6	0.6	1156.7	0.1	17.5	0.0
Leather products	88.3	0.0	67.6	0.0	0.6	0.0
Wood products	64.6	0.0	243.2	0.0	51.3	0.0
Paper products, publishing	2413.7	0.6	5549.3	0.7	418.4	0.1
Petroleum, coal products	155.0	0.0	209.2	0.0	109.9	0.0
Chemical, rubber, plastic products	*97093.1*	*25.1*	*357378.0*	*45.3*	7554.3	1.6
Mineral products nec	7.4	0.0	97.7	0.0	33.3	0.0
Ferrous metals	691.6	0.2	786.1	0.1	1454.6	0.3
Metals nec	0.0	0.0	0.0	0.0	0.0	0.0
Metal products	6920.8	1.8	22233.6	2.8	*74887.5*	*15.5*
Motor vehicles and parts	3032.9	0.8	4318.4	0.5	1914.5	0.4
Transport equipment nec	*24757.1*	*6.4*	8487.6	1.1	*65649.8*	*13.6*
Electronic equipment	13698.5	3.5	10742.3	1.4	1701.6	0.4
Machinery and equipment nec	*50925.4*	*13.2*	*60115.3*	*7.6*	*84631.9*	*17.5*
Manufactures nec	9357.7	2.4	29619.6	3.8	7590.6	1.6
Electricity and gas	*19565.6*	*5.1*	*54147.7*	*6.9*	*184498.5*	*38.2*
Transport svs	1726.1	0.4	8432.7	1.1	1187.7	0.2
Other commercial svs (OCS)	*152022.3*	*39.3*	*219674.8*	*27.8*	*50335.6*	*10.4*
Other govt svs (OSG)	108.6	0.0	1974.6	0.3	378.3	0.1
Total	**386515.4**	**100.0**	**789644.3**	**100.0**	**482438.9**	**100.0**

Source: UNSNA, GTAP, OECD, UN Comtrade, OECD Bilateral Trade in Services; own calculations.

F. Inference

Given market access interests on either side of the Atlantic, the sectors more likely to witness reciprocal liberalization in the TTIP include OCS, transport services, chemicals-rubber-plastics, food-beverages-tobacco, transport equipment, electronic equipment, machinery and equipment, motor vehicles and parts and metal products. Our analysis suggests that Swiss suppliers and service providers are also significant players in these sectors in both markets. So any reciprocal liberalization in the TTIP in these sectors may enhance the US's already significant role as a foreign supplier in EU procurement markets and also make the EU a more important supplier in US procurement markets, both at the expense of Switzerland. On the other hand, looking at the composition of Swiss public demand, it is less likely that such reciprocal liberalization would divert EU and US suppliers away from the Swiss procurement markets towards each other.

This said, the Baldwin (1970) and Baldwin-Richardson (1972) "neutrality proposition" suggests that any effects of the resulting discrimination in EU and US procurement markets that Swiss suppliers and service providers may face are likely to be offset by increased private sector demand in sectors where public demand is a small share of output and where products are more homogeneous. This suggests that any adverse effects of preferential procurement liberalization in the TTIP for Swiss suppliers and service providers are more likely in services, which are not only more differentiated but where public demand as a share of output is comparatively larger in both the EU and the US.

G. Procurement liberalization in the Canada-EU CETA as a benchmark

Under the recently negotiated Comprehensive Economic and Trade Agreement (CETA) between Canada and the EU, all sub-federal levels of government in Canada have committed themselves to bilaterally opening up their procurement markets. The value of public contracts awarded at the non-federal level is significantly larger (7% of Canadian GDP) so this has important market access implications for EU suppliers and service providers. The Canadian market access offer is the most ambitious and comprehensive that the country has ever made, including in comparison to what has been offered in the WTO agreements and to the US. In terms of coverage, the inclusion of regional and local government entities is much better than what Canada offered even in the RGPA and to the US. In particular, Canada's offer now includes a satisfactory coverage of major energy utilities[79], notably in Ontario and Quebec, as well as sufficient coverage of goods and services of interest to the EU[80].

It is likely that procurement negotiations in the TTIP will follow a similar route and attain a similar outcome, which could thus be at the expense of Swiss suppliers and service providers, especially in the case of sub-federal level procurement in the EU and US and that undertaken by utilities. This said, utilities are more privately-owned in the US compared to the EU, where there is more heterogeneity in ownership from almost full public ownership in France to almost full private ownership in the UK for instance. Given that the private sector is not saddled with non-economic objectives like the government, cost-minimization in the allocation of contracts suggests that there may be lesser tendency to discriminate against Swiss suppliers if they are more efficient, despite any preferential procurement liberalization in the TTIP. To that extent, Swiss suppliers of utilities may be less adversely affected by successful TTIP negotiations in the US market compared to the EU.

Canada will also create **a single electronic procurement website** that combines information on all tenders and access to public procurement at all levels of government. While this will make it much easier for European suppliers to compete in the Canadian procurement market, it may also have an *"erga omnes"* effect.

[79] More than 70% of the sector is covered under CETA's procurement chapter. Note that Canadian Annex 3 procurement was restricted to EU suppliers and service providers even in the RGPA.

[80] Notably, the CETA also includes a "Regional Development Clause" that carves out a limited proportion of sub-federal procurement in 8 Canadian Provinces and Territories for regional development purposes; the solution is sufficiently precise and limited in scope so as not to harm EU economic interests (at a maximum CAN$10mn per Province/Territory per year). In addition, even though the Canadian offer is the best that the country has ever made, the EU's offer (which reflects its *de facto* openness) is still more ambitious, and both sides have therefore "re-balanced" their offers. Thus the EU has restricted (procurement) market access to its ports, airports and auditing/accounting/book-keeping services while Canada has included foreign legal advisory services in its procurement commitments under the CETA.

H. Conclusion

This section of the report examines the likely impact of potential government procurement liberalization in the TTIP on Swiss suppliers and service providers. Our qualitative analysis discusses the potential areas and issues of interest that are likely to form a part of the negotiations. These include *inter alia* liberalization of sub-federal procurement including parity in contestable thresholds, and coverage of procurement undertaken by utilities. Our quantitative assessment identifies sectors important from a market access perspective for EU and US suppliers and service providers in each other's procurement markets. These include other commercial services, transport services, chemicals-rubber-plastics, food-beverages-tobacco, transport equipment, electronic equipment, machinery and equipment, motor vehicles and parts and metal products. Our analysis suggests that Swiss suppliers and service providers are also significant players in these sectors in both markets. Successful coverage of these sectors in the TTIP would therefore enhance market contestability on either side that may have adverse implications for Switzerland. However, in keeping with the Baldwin-Richardson (1972) "neutrality proposition," any adverse effects for Swiss suppliers and service providers are more likely in the services sectors, which are not only more differentiated but where public demand as a share of output is comparatively larger in both the EU and the US. Finally, we also consider procurement liberalization in the recently negotiated Canada-EU CETA as a benchmark in our analysis and conclude that reciprocal liberalization of sub-federal procurement in the TTIP may lead to greater challenges for Swiss suppliers and service providers in EU and US markets.

VI. Additional Aspects of Interest

A. The T-TIP's Impact on FDI

Trade agreements increasingly entail components relating to investment protection. This is partly inherent in the liberalization of services and serves the purpose to enhance protection and enforcement of intellectual property rights. Beyond this, specific chapters on investment protection have been introduced since the NAFTA Agreement Chapter XI. Both in the US and the EU, authority to negotiate on investment is the USTR and the Commission, respectively. It therefore is likely that the T-TIP will contain a chapter on investment protection. It is highly controversial, however, whether the agreement will revert to Investor-State arbitration common under NAFTA and most bilateral investment protection agreements.

Investor-State arbitration emanates from state failures in developing countries to provide adequate legal protection. Developed countries, based upon the rule of law, ever since relied upon domestic courts addressing claims of private investors against government, backed up by international intergovernmental adjudication. The same holds true in European and US relations. Investment disputes are settled by domestic courts and are subject to international adjudication (e.g. ICJ, ELSI Case). Protection of investment in WTO law, however, shows lacunae, for example in cases of regulatory taking of trademark rights (United States Sec 211 Omnibus Appropriation Act). Business on both side of the Atlantic therefore is in support of government independent Investor-State arbitration. Public interest groups, however, fear the loss of regulatory powers in addressing issues relating to health, the environment or security. There has been increasing resistance against Investor-State arbitration among developed countries and with emerging economies.

The bilateral introduction of Investor-State arbitration and protection between the US and the EU will create procedural benefits not extended to Swiss companies. It may influence US companies to invest in one of the EU Member States rather than in Switzerland. However, much depends upon the level of domestic protection against formal and regulatory taking in Swiss law. To the extent that levels of protection are the same or even higher than under T-TIP, diversion of investment protection can be avoided. Dependent upon the outcome of T-TIP, it is suggested to review levels of protection under constitutional and federal law.

Furthermore, the incentive for Swiss companies engaged in FDI to relocate their company to the European market needs to be taken into consideration: with a head office in

the EU, Swiss companies would get unrestricted access to the European market, the full advantages of market access of the T-TIP in the US market, and still have market access to the Swiss market secured through the close trade relations between the EU and Switzerland. Especially when the procedural benefits in Investor-State arbitration in the T-TIP turn out to be substantial, such incentives should not be underestimated.

B. The T-TIP's Impact on IP Protection

The US and the EU have been on the forefront of enhancing intellectual property protection on a global scale and in bilateral agreements. They operate both under high levels of protection. The subject has not been in the forefront of negotiations and discussions, and little is known – unlike in the Trans-Pacific TPP Agreement under negotiations mainly with developing countries.

Differences between the two parties are not extensive, and mainly relate to protection and enforcement of software and downloading for non-commercial purposes. They include differences on the protection in copyright and neighbouring rights that may materialize in the context of protecting cultural services much emphasized by France. They exist in the field of Geographical Indications, supported by the EU while refuted by the US and addressed by means of collective marks and certified marks. It may be that IP will be part of the regulatory process installed between the countries in terms of harmonizing standards and levels of IP protection and lead towards greater coherence and cooperation, and even transatlantic harmonization over the years. At the same time, it is recalled that the fine-tuning of IP protection and enforcement to a large extent is a prerogative of independent courts and therefore subject to separation of powers.

Any improvement achieved under T-TIP in the field of IPRs will be subject to Article 4 of the TRIPS Agreement. Switzerland is entitled to Most-Favoured Nation (MFN) treatment independently of existing levels of protection in the TRIPS Agreement. Should levels of protection and enforcement increase in EU-US relations, Switzerland and other Members of the WTO are entitled to obtain treatment no less favourable. There is an important spillover effect that enhances Swiss interests. The main exceptions of importance relate to the protection of copyright under the Berne Convention, allowing for reciprocity treatment. In this regard, one should keep in mind that the US is not part of the Rome Convention. It is conceivable that a transatlantic system of remuneration of media and internet use of works and performances may develop over time, engaging collecting societies on both sides of the Atlantic. This inherently will be a long term process.

Overall, Switzerland is likely to benefit from spillover effects of advancements of IPR protection in the T-TIP. It is likely to inform a standard for subsequent negotiations in

the WTO, the WIPO and bilateral agreements worldwide. It will align US and EU interests in negotiations with emerging economies and developing countries.

C. In Particular: The T-TIP and Trade in Licensing

Trade statistics of Switzerland show a high level of income generated through intellectual property licensing. A considerable number of parent Multilateral Corporations sourced the management of IPR rights, including licensing of patents and trademarks, to companies located in Switzerland. The location is attractive due to its geography at the heart of Europe, and to tax privileges extended to holding and management companies for the transactions taking place abroad (holding privilege). Licensing fees generated in business abroad is not subject to corporate taxation.

The privilege has been under pressure from the European Union for some time and is likely to be removed and rendered subject to non-discriminatory taxation of all business transactions alike. On-going discussion on tax reform seek a replacement by means of IP boxes, i.e. tax exemption of income generated by licensing and other business related to intellectual property rights. Such exemptions, in light of emerging OECD and EU standards, are likely to be accepted in the field of research and development, but hardly in the field of managing existing trademarks. In Switzerland, i.e. the Cantons mainly of Zug, Basle and Geneva, are likely to lose existing tax privileges, independently of T-TIP.

There are no indications known that taxation of licensing is an issue in T-TIP negotiations. Both the US and the EU are likely to evolve along the standards under development within the OECD. Overall, it is expected that a level playing field will emerge to which Switzerland will be aligned.

D. In Particular: Better Recognition of Standards

Unilateral adoption of transatlantic standards reaches its limits where they depend upon recognition of testing by trading partners. Failing such recognition, industries are obliged to seek testing and approval in importing countries, adding thus to the costs of the product and thus affecting its competitiveness. It is likely that the US and the EU will engage in an extensive framework for recognition of standards, defining procedures and bodies authorized to grant product and process approval valid for both parties at the same time. This will amount to an essential tool of trade facilitation between the two markets.

Switzerland enjoys the benefits of a relatively unique Mutual Recognition Agreement (MRA) with the EU, but not with the US. In relation to exports to the EU, this present MRA may offer an appropriate framework to take into account emerging EU-US standards for the purpose of exports to the EU. For example, components for cars may be tested in accordance and on the basis of such new standards and thus be incorporated in EU products.

This option does not exist with the US. Swiss companies exporting the US face the need to test and approve with US authorities, while competitors in the EU will benefit from mutual recognition and, thus, from lower costs. Hence, in addition to the removal of tariffs, Swiss companies will suffer from additional disadvantages that may force them to dislocate, leaving Switzerland.

With this starting position in mind and considering that regulatory convergence increasingly is the primary channel for further trade facilitation and liberalization in the future, increasingly engaging in regulatory convergence appears timely in the case of Switzerland. Such policy is not inherently linked with the T-TIP, but the implications of the T-TIP further highlight the growing importance of regulatory convergence.

VII. Summary and Conclusion

The prospects of the T-TIP, at this point in time, are difficult to assess. Neither is the scope of negotiations clearly defined, nor are there any texts or conceptual understandings available based upon which an impact assessment on Switzerland can be effected. For this reason, this study examines existing agreements, as well as the impact of current arrangements on trade flows (i.e. EU-EFTA) to gauge scope for EU-US liberalization, and for relative erosion of Swiss market access conditions vis-à-vis US firms in the EU market and vice versa. This is followed by a quantitative assessment based on a CGE model.

The comparative findings on preferential market access in services induce a note of caution. Governments have been reluctant to grant extensive liberalization in preferential agreements going much beyond the levels of GATS. It begs the question whether this will be fundamentally different in EU-US relations. There are fundamental objections on the part of the US to include financial services, and reservations were made on the part of the EU to include cultural services. At the same time, there is a considerable potential that US companies will achieve competitive advantages in EU markets due to the fact that Switzerland still does not have a PTA on Services with the EU.

The strong emphasis on non-tariff barriers, addressing behind the border issues, indicates that mutual recognition of testing and admission will be an important feature facilitating transatlantic trade. The same holds true, particularly for the US market, for mutual recognition of diplomas and certificates of service suppliers. While Switzerland can build upon an MRA and the agreement on the free movement of persons with the EU, a similar instrument in trade relations with the US has been missing.

The trade diversion impact of a EU-US agreement translates, at a macroeconomic level, to falling GDP (around 0.2 percent to 0.8 percent), falling household consumption, and a substantial restructuring of the pattern of Swiss industrial production. Precisely how strong these effects will be hinge on the Swiss response as well. For example, if there is a parallel EFTA-US tariff agreement, this helps to offset some of the trade diversion effects. An NTB agreement actually turns losses to gains. In the absence of parallel Swiss-US agreements, macroeconomic impacts are broadly negative. In addition, based on the scope for what are known in the recent policy literature as MFN spillovers, Swiss industry may actually benefit from EU-US regulatory convergence. In particular, if standards and regulations are streamlined, it may become easier for third countries to conform to these standards in both markets, even if they are outside the process that sets those standards. For example, it may become easier to meet consumer safety standards for an

integrated or mutual recognition regime, as opposed to two different and independent regimes. Through the MRA CH-EU Switzerland continues streamlining/harmonizing its technical regulations with the EU's. Therefore Switzerland will benefit more from MFN spillovers than other third countries. If such opportunities exist, and Swiss industry takes advantage of these opportunities, then projected losses to GDP, consumption, and wages may be partially or even totally offset. Indeed in such a case, the greater the NTB reductions, and the greater the MFN spillovers from bilateral liberalization, the more important this channel for potential gains rather than losses for Switzerland.

On public procurement, our findings suggest that Swiss suppliers and service providers are likely to lose contestability in both the EU and US markets, especially in services sectors and at the US sub-federal level, from successful preferential procurement liberalization in the TTIP.

In summary, the qualitative and quantitative exercises here point to both risk (with a passive Swiss response) and opportunity (with an active one).

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Annexes

A. Technical Annex for CGE model

In this annex we provide an overview of the modelling exercise summarized in the main body of the paper. In the computational model, the "whole" economy, for the relevant aggregation of economic agents, is modelled simultaneously. This means that the entire economy is classified into production and consumption sectors. These sectors are then modelled collectively. Production sectors are explicitly linked together in value-added chains from primary goods, through higher stages of processing, to the final assembly of consumption goods for households and governments. These links span borders as well as industries. The link between sectors is both direct, such as the input of steel into the production of transport equipment, and also indirect, as with the link between chemicals and agriculture through the production of fertilizers and pesticides. Sectors are also linked through their competition for resources in primary factor markets (capital, labour, and land). The data structure of the model follows the GTAP database structure, and basic models of this class are implemented in either GEMPACK or GAMS (Hertel 1997, Hertel et al 1997, Rutherford and Paltsev 2000). We work here with a GEMPACK implementation.

A.1 Production

An algebraic version of the GE system is summarized in Equation Table A1.1. We start here with a representative production technology. Assume that output q_j in sector j can be produced with a combination of intermediate inputs z^j and value added services (capital, labour, land, etc.) va^j. This is formalized in equation 1. Assuming homothetic cost functions and separability, we can define the cost of a representative bundle of intermediate inputs z^j for the firm producing q^j and similarly the cost of a representative bundle of value added services va^j. These are shown in equations 2 and 3. They depend on the vector of composite goods prices $\tilde{P}$ and primary factor prices ω. Unit costs for q then depend on the mix of technology and prices embodied in equations 1,2,3. We represent this in equation 4, which defines unit cost ς^j. In the absence of taxes, in competitive sectors ς^j represents both marginal cost and price. On the other hand, with imperfect competition on the output side (discussed explicitly later) ς^j can be viewed as measuring the marginal cost side of the optimal markup equation, with markups driving a wedge between ς^j and P^j.

To combine production technologies with data, we need to move from general to specific functional forms. We employ a nested CES function, with a CES representation of value added activities va^j, a CES representation of a composite intermediate z^j made up of intermediate inputs, and an upper CES nest that then combines these to yield the final good qj. Our set-up is illustrated in Figure 1 below, on the assumption we have *i* primary factors v, as well as *n* production sectors that can be represented in terms of composite goods $\tilde{q}$ as defined below. These composites may (or may not, depending on the goods involved) be used as intermediate inputs. In Equation Table A1.1, we have also shown the CES substitution elasticity for intermediate inputs ϕ, the substitution elasticity for value added σ, and the substitution elasticity for our "upper nest" aggregation of value added and intermediates, ψ. In the absence of taxes, total value added *Y* will be the sum of primary factor income, as in equation 5.

Given our assumption of CES technologies, we can represent value added in sector *j* as a function of primary inputs and the elasticity of substitution in value added σ^j. This yields equation 6, and its associated CES price index shown in equation 7. Similarly, we can specify the CES price index for composite intermediates, as in equation 7. This gives us equation 8, where the coefficient ϕ^j is the elasticity of substitution between intermediate inputs. This is assumed to be Leontief (i.e. ϕ^j = 0). Finally, following Equation Table A1.1, we will also specify an aggregation function for value added and intermediate inputs, in terms of its CES price index. This is shown as equation 9. From the first order conditions for minimizing the cost of production, we can map the allocation of primary factors to the level of value added across sectors. This is formalized in equation 10. We can also specify the total demand for composite intermediate goods across sectors $\tilde{q}^{\text{int},i}$ as a function of the producer price of composite input price P_{z^j} in each sector, the scale of intermediate demand across sectors z^j, and prices of composite goods $\tilde{P}_i$. This is shown in equation 11. Finally, with the upper nest CES for goods we can also map value added va^j and intermediate demand z^j in terms of equations 7 and 8, output q^j and the elasticity of substitution ψ^j between inputs and value added. This yields equations 12 and 13, where the terms γ are the CES weights (similar to those in equation 6) while ψ^j is the upper nest elasticity of substitution in the production function.

We define the price of output at industry level as in equation 14. In this case, ς^j is defined by equation 9 and represents the price of a bundle of inputs, and equation 14 follows directly from average cost pricing and homothetic cost functions. (It can also accommodate Dixit-Stiglitz type monopolistic competition. See Francois and Roland-Holst 1997, Francois 1998, and Francois, van Meijl, and van Tongeren 2005 for explicit derivations.)

Together, equations 1 through 14 map out the production side of the economy. For an open economy, given resources, technology (represented by technical coefficients in the CES functional forms), and prices for foreign and domestic goods and services, we can determine factor incomes, national income, and the structure of production. We close this system by discussion of the demand side of the economy, and basic open economy aspects, in the next sections.

Equations Table A.1

(1) $q^j = f^j\left(z^j, \mathrm{va}^{\mathrm{j}}\right)$

(2) $P_z = g\left(\tilde{P}\right)$

(3) $P_{\mathrm{va}} = h\left(\omega\right)$

(4) $\zeta_j = c\left(P_z, P_{\mathrm{va}}\right)$

(5) $Y = \sum_i \omega_i v_i$

(6) $\mathrm{va}_j = \left[\sum_i \alpha_{ij} v_{ij}^{\frac{\sigma^j - 1}{\sigma^j}}\right]^{\frac{1}{\sigma^j - 1}}$

(7) $P_{v^j} = \left[\sum_i \alpha_{ij}^{\sigma^j} \omega_i^{1-\sigma^j}\right]^{\frac{1}{1-\sigma^j}}$

(8) $P_{z^j} = \left[\sum_i \beta_{ij}^{\phi^j} \tilde{P}_i^{1-\phi^j}\right]^{\frac{1}{1-\phi^j}}$

(9) $P_j = \left(\gamma_{vj}^{\psi^j} P_{\mathrm{va}^j}^{1-\psi^j} + \gamma_{zj}^{\psi^j} P_{z^j}^{1-\psi^j}\right)^{\frac{1}{1-\psi^j}}$

(10) $v_i \geq \sum_j \mathrm{va}^j \left(\frac{\alpha_{vj}}{\omega_i}\right)^{\sigma^j} P_{\mathrm{va}^j}$

(11) $\tilde{q}^{\mathrm{int,i}} = \sum_j z^j \left(\frac{\beta_{ij}}{\tilde{P}_i}\right)^{\phi^j} P_{z^j}$

(12) $\mathrm{va}^j = q^j \left(\frac{\gamma_{vi}}{P_{v^j}}\right)^{\psi^j} P_j$

(13) $\bar{z}^j = q^j \left(\frac{\gamma_{zi}}{P_{z^j}}\right)^{\psi^j} P_j$

(14) $P_j = q_j^{\psi} \left(\gamma_{vj}^{\psi^j} P_{\mathrm{va}^j}^{1-\psi^j} + \gamma_{zj}^{\psi^j} P_{z^j}^{1-\psi^j}\right)^{\frac{1}{1-\psi^j}}$
where $1 > \psi > 0$

(15) $P_{U^c} = \left(\sum_{i=1}^{n} \alpha_{c,i}^{\eta^c} \tilde{P}_i^{1-\eta^c}\right)^{\frac{1}{1-\eta^c}}$
where $0 < \frac{\eta^c - 1}{\eta^c} < 1$

(16) $U^c \left(\sum_{i=1}^{n} \alpha_{c,i}^{\eta^c} \tilde{P}_i^{1-\eta^c}\right)^{\frac{1}{1-\eta^c}} = Y\theta^c$

(17) $U^c = \left(\sum_{i=1}^{n} \alpha_{c,i}^{\eta^c} \tilde{P}_i^{1-\eta^c}\right)^{\frac{1}{\eta^c - 1}} Y\theta^c$

(18) $\tilde{q}^{c,i} = U^c P_{U^c}^{\eta^c} \alpha_{c,i}^{\eta^c} \tilde{P}_i^{-\eta^c}$

(19) $P_{U^g} = \left(\sum_{i=1}^{n} \alpha_{g,i}^{\eta^g} \tilde{P}_i^{1-\eta^g}\right)^{\frac{1}{1-\eta^g}}$
where $0 < \frac{\eta^g - 1}{\eta^g} < 1$

(20) $U^g \left(\sum_{i=1}^{n} \alpha_{g,i}^{\eta^g} \tilde{P}_i^{1-\eta^g}\right)^{\frac{1}{1-\eta^g}} = Y\theta^g$

(21) $U^g = \left(\sum_{i=1}^{n} \alpha_{g,i}^{\eta^g} \tilde{P}_i^{1-\eta^g}\right)^{\frac{1}{\eta^g - 1}} Y\theta^g$

(22) $\tilde{q}^{g,i} = U^c P_{U^c}^{\eta^g} \alpha_{g,i}^{\eta^g} \tilde{P}_i^{-\eta^g}$

(23) $\left(\sum_{j=1}^{n} \alpha_{I,j} \tilde{P}_j\right) = Y\theta^I$

(24) $\omega_k = P^c\left(\rho + \delta\right)$

(25) $dK/K = dI/I$

(26) $\tilde{P}_j = \left(\sum_{r=1}^{R} b_{r,j}^{s^j} P_{r,j}^{1-s^j}\right)^{\frac{1}{1-s^j}}$
where $0 < \frac{s^j - 1}{s^j} < 1$

(27) $D_j = \left(\tilde{q}^{\mathrm{c,j}} + \tilde{q}^{\mathrm{I,j}} + \tilde{q}^{\mathrm{g,j}} + \tilde{q}^{\mathrm{int,i}}\right) \tilde{P}_j^s b_{h,j}^s P_{h,j}^{-s}$

(28) $M_j = D_j - q_j$

(29) $\left(\sum_{r=1}^{rr} M_{r,j}\right) = 0$

(30) $\left(\sum_j \sum_{r \neq h} P_{r,j} M_{r,h,j}\right) = B_h$

(31) $\left(\sum_r B_r\right) = 0$

A.2 Final Demand

In the system we have spelled out so far, we have mapped the basic, national structure of production. We close the system with a demand specification for a representative household. This involves allocation of regional income by the household to composite consumption H, which is separated over private consumption C, public consumption G, and investment I. Each of these components of H involves consumption of composite goods and services $\tilde{q}$ indexed by sector *j*. Where we assume fixed expenditure shares (i.e. with H taking a Cobb-Douglas functional form), then we also have a fixed savings rate. Otherwise, given the equilibrium allocation of household income to consumption and investment, we will denote these expenditure shares by θ. We maintain a fixed-share allocation between public and private consumption.

We assume a well-defined CES utility function for personal consumption defined over goods $\tilde{q}$. From the first order conditions for utility maximization, we can then derive the price of utility from private consumption P_U as a function of prices $\tilde{P}$, as in equation 15. The corresponding expenditure function is then $U = U^c P_U$ where U^c is the level of utility from private consumption. Taking national income as our budget constraint, then combining equation 5 with the expenditure function yields equation 16. From 16, we can define U^c from the expenditure function and income, as in equation 17. Consumption quantities, in terms of composite goods, can be recovered from equation 17, as shown in equation 18. Like private consumption, the public sector is also modelled with a CES demand function over public sector consumption. This implies equations 19-22.

For investment demand, in the short run, we assume a fixed savings rate. In the long-run, the model can alternatively incorporate a fixed savings rate, or a rate that adjusts to meet steady state conditions in a basic Ramsey structure with constant relative risk aversion (CRRA) preferences. We employ the CRRA version here. (Francois, McDonald and Nordstrom 1996, 1997). With fixed savings, and assuming a Leontief composite of investment goods that make up the regional investment good, investment demand is defined by equation 23. With CRRA preferences, steady-state conditions imply equation 24 as well, related to the price of capital ω_k. Where 24 holds, the additional equation allows us to make the savings rate coefficient θ^I endogenous. In equation 24 ρ is the rate of time discount and δ is the rate of depreciation. With a short-run or static closure, investment demand means we apply equation 23. With a long-run closure, we also apply equation 25. When we impose CRRA preferences in the long-run, as in the present paper, we then employ all three equations on the model 23-25, and savings rates are endogenous. With a fixed savings rate, we drop equation 24 and make θ^I exogenous. We have modelled the long-run here, so that all three equations hold.

A.3 Cross-border linkages and taxes

Finally, individual countries, as described by equations 1-25 above, are linked through cross border trade and investment flows. With either monopolistic competition or Armington preferences, we can define a CES composite good $\tilde{q}$ in terms of foreign and domestic goods. The price index for this composite good is defined by equation 26. Given equation 26 and the envelope theorem, we can define domestic absorption D as in equation 27, where *h* indexes home prices and quantities. The difference between production q_j and domestic absorption D_j in equilibrium will be imports (where a negative value denotes exports), as in equation 28. Across all countries indexed by *r*, we also have a global balanced trade requirement, shown in equation 29. Similarly, balancing the global capital account also requires equations 30 and 31 (where we now index source *r* and home destination *h*).

The basic system outlined above provides the core production and demand structure of each region, as well as the basic requirements for bilateral import demand, global market clearing for traded goods and services, and global capital account balancing. Within this basic structure, we also introduce taxes, transport services, iceberg (deadweight) non-tariff barriers, and rent-generating non-tariff barriers. These drive a wedge between the ex-factory price originating in country *r* and the landed prices in country *h* inclusive of duties and transport costs. Taxes and rent-generating trade costs mean that *Y* is also inclusive of tax revenues and rents. In the short-run we fix *B*, while in the long-run this is endogenous (such that the distribution of relative global returns is maintained). All of this adds additional complexity to the system outlined above, but the core structure remains the same.

In a set of alternative labour market closures (better suited for short-run analysis), we also specify supply of labour (both more skilled and less skilled) as a function of the prevailing real wage rate, meaning that

(32) $l = a(w / P_c)^e$

where (w / P_c) is the wage deflated by consumer prices and *e* is the long run labour supply elasticity. From the DSGE literature, we then take a value of *e*=0.4. We do not apply equation (32) in this paper.

A4 Trade And Transportation Costs And Services Barriers

International trade is modelled as a process that explicitly involves trading costs, which include both trade and transportation services. These trading costs reflect the transaction costs involved in international trade, as well as

the physical activity of transportation itself. Those trading costs related to international movement of goods and related logistic services are met by composite services purchased from a global trade services sector, where the composite "international trade services" activity is produced as a Cobb-Douglas composite of regional exports of trade and transport service exports. Trade-cost margins are based on reconciled f.o.b. and c.i.f. trade data, as reported the GTAP dataset.

A second form of trade costs is known in the literature as frictional trading costs. These are implemented in the model, following Francois (1999, 2001), as a Samuelson iceberg- or frictional-type trade cost. Trade costs are also implemented in this way for traded goods, so that we can examine the impact of trade facilitation. Such costs represent real resource costs associated with producing a good or service for sale in an export market instead of the domestic market. Conceptually, we have implemented a linear transformation technology between domestic and export goods and services. [81] Finally, we also include trade costs from exercise of market power (generation of rents) as discussed in the main text. Following CEPR (2013) these are markups that are reduced with liberalization of the regulations that protect the underlying rents. Such rents are modelled in the same way as taxes, though they are collected by firms. See Francois, Manchin, and Martin (2013) for further discussion.

[81] The Francois (1999) GEMPACK implementation in the form of a technical change parameter in production for export has since been added to the standard GTAP model as of version 6.0 (2001), as the parameter “ams”.

B. Swiss Trade and Value Added

This annex describes the value added structure of the Swiss economy, both in terms of overall GDP, and also the relationship of Swiss production to trade on a value added basis. The methodology follows Francois, Manchin, and Tomberger (2013).

The complex structure global trade and production datasets (GTAP in this case) dataset allows us to obtain the value added content of final output and exports including both direct and indirect value added. In order to obtain these, we first need to calculate intermediate multiplier matrixes that will be then used to multiply exports and final outputs to obtain the corresponding value added shares. The first matrix that is calculated is the widely used Leontief matrix (M) that measures the inputs contained in a unit of final output. This M matrix contains both direct and indirect inputs. Next, we need to calculate a matrix that has the value added shares of total output (which will be matrix $\hat{B}$). Using these two matrixes as multipliers one can obtain the value added shares of exports and final outputs. This is explained in what follows more formally.

We begin by denoting a representation of intermediate and final demands as follows:

Y=Z—AZ (1)

In equation (1), the term Y denotes a final demand vector, Z denotes a gross output vector, and A denotes a matrix of intermediate use coefficients. Equation (1) therefore defines final output with respect to intermediate input requirements. With some manipulation we arrive at the Leontief inverse matrix, also known as the multiplier matrix M.

Z=(I—A)−1 Y=MY (2)

The multiplier matrix M measures the inputs contained in a unit of final output. In particular, if we assign the sector indexes i, j to the A and M matrices, then a representative element of the M matrix M_{ij} gives the direct and indirect inputs (and thus the sector i receipts) linked to each unit (for example each dollar) of sector j receipts in the data.[82] This implies real production activities measured by value of output. For our purposes, it provides a means

[82] In multiplier analysis with fixed input coefficients, these values also represent fixed unit input requirements in value terms, though of course in CGE models one can allow for these coefficients to be endogenous.

to trace, through these income flows, the flow of gross activity and value added from intermediate to final goods and services, ostensibly across borders as well as sectors. Because linkages will vary by industry, different multipliers will characterize each industry. To focus on value added, we note first that in terms of gross output values Z, some share of this involves value added within each sector. We define $\hat{B}$ as the diagonal matrix indexed over i,j with diagonal elements equal to the value added shares of output Z. We then use M to provide a breakdown of the flow of value added across activities in the form of the matrix V.

$$V = \hat{B}\,M \tag{3}$$

Similar to the Leontief inverse matrix itself, the V matrix identifies the inputs of value added in each sector related to a unit of final demand. If we multiply V by the diagonal matrix $\hat{Y}$ whose non-zero elements are the vector of final outputs, the matrix yields a breakdown of economy-wide value added (the primary component of Gross National Product on a source basis). Similarly, if we multiply V by the diagonal matrix $\hat{X}$ whose non-zero elements are the national export vector, we can recover the value added content of exports X (both direct and indirect).

$$G = V\,\hat{Y} \tag{4}$$

$$H = V\,\hat{X} \tag{5}$$

The G matrix and the H matrix give us the set of linkages, both direct and indirect, between value added across sectors.

In the present context, we have applied the transformation represented by (5) to both total exports and exports to specific destinations.

Table B.1: Structure of Swiss Economy 2011, value added basis

	million dollars		shares	
	total value added	backward linkages	total value added	backward linkages
agr forestry fisheries	5,420	3,666	0.86	0.58
other primary sectors	883	1,540	0.14	0.24
dairy	4,424	6,895	0.70	1.09
sugar	276	251	0.04	0.04
other processed foods	9,181	16,111	1.46	2.56
textiles and apparel	1,543	1,819	0.24	0.29
chemicals	27,723	45,217	4.40	7.18
metals and metal products	22,958	28,336	3.64	4.50
motor vehicles	921	1,193	0.15	0.19
other transport equipment	1,922	2,863	0.31	0.45
electrical machinery	3,545	4,861	0.56	0.77
other machinery	37,977	59,766	6.03	9.49
other manufactures	20,564	14,334	3.26	2.28
utilities	5,913	4,336	0.94	0.69
construction	36,090	41,282	5.73	6.55
water transport	1,061	1,023	0.17	0.16
air transport	2,407	2,682	0.38	0.43
land, other transport	20,527	15,241	3.26	2.42
communications	17,140	11,760	2.72	1.87
finance	41,925	22,313	6.65	3.54
insurance	16,566	18,066	2.63	2.87
business & ICT services	68,113	29,260	10.81	4.64
personal services	15,274	15,342	2.42	2.44
other services	267,667	281,861	42.49	44.74
Total factor income	630,020	630,020	100.00	100.00
addendum: indirect taxes	29,286	29,286		

Souce: GTAP9 (base year 2011)

Table B.2: Structure of Swiss Exports to World 2011, value added basis

Million dollars

	gross exports	direct value added	direct and backward linkages	direct and forward linkages
agr forestry fisheries	1,916	1,196	1,626	2,166
other primary sectors	1,948	709	1,526	787
dairy	833	350	654	599
sugar	162	75	100	103
other processed foods	9,892	3,079	7,066	3,574
textiles and apparel	2,696	1,104	1,482	1,194
chemicals	76,696	27,434	44,970	27,489
metals and metal products	69,232	19,879	28,295	21,821
motor vehicles	2,264	734	981	741
other transport equipment	4,011	1,242	2,001	1,309
electrical machinery	3,431	1,390	2,137	1,563
other machinery	76,766	29,007	47,096	29,188
other manufactures	17,331	7,850	11,273	11,408
utilities	2,089	1,467	1,788	2,732
construction	142	72	103	1,770
water transport	1,377	379	702	649
air transport	2,771	867	1,796	1,309
land, other transport	5,987	3,005	4,821	8,121
communications	1,360	937	1,159	3,582
finance	12,352	9,614	11,454	17,436
insurance	6,192	4,181	5,762	5,540
business & ICT services	12,251	8,294	10,010	26,920
personal services	1,195	751	1,039	2,202
other services	13,072	9,916	11,832	27,471
Total	325,965	133,534	199,672	199,672

Table B.3: Structure of Swiss Exports to Germany 2011, value added basis

Million dollars

	gross exports	direct value added	direct and backward linkages	direct and forward linkages
agr forestry fisheries	56	35	48	220
other primary sectors	15	6	12	18
dairy	293	123	230	170
sugar	1	1	1	6
other processed foods	1,869	582	1,335	679
textiles and apparel	871	356	479	374
chemicals	16,626	5,947	9,748	5,957
metals and metal products	7,955	2,284	3,251	2,701
motor vehicles	921	299	399	300
other transport equipment	766	237	382	250
electrical machinery	728	295	453	330
other machinery	16,531	6,246	10,142	6,277
other manufactures	3,481	1,577	2,264	2,241
utilities	227	159	194	405
construction	20	10	15	312
water transport	108	30	55	79
air transport	553	173	359	258
land, other transport	1,250	628	1,007	1,581
communications	326	225	278	706
finance	728	567	675	1,995
insurance	494	333	460	583
business & ICT services	2,552	1,728	2,085	5,125
personal services	240	151	209	418
other services	1,974	1,498	1,787	4,882
Total	58,587	23,490	35,868	35,868

Source: GTAP9 (base year 2011)

Table B.4: Structure of Swiss Exports to EU27 (excl. Germany) 2011, value added basis
Million dollars

	gross exports	direct value added	direct and backward linkages	direct and forward linkages
agr forestry fisheries	255	159	217	478
other primary sectors	626	228	490	248
dairy	296	124	232	205
sugar	5	2	3	11
other processed foods	3,130	974	2,236	1,148
textiles and apparel	970	397	533	426
chemicals	28,001	10,016	16,418	10,032
metals and metal products	11,848	3,402	4,842	3,908
motor vehicles	812	263	352	266
other transport equipment	1,733	537	864	560
electrical machinery	972	394	605	442
other machinery	19,324	7,302	11,856	7,361
other manufactures	6,353	2,877	4,132	4,012
utilities	1,023	718	875	1,123
construction	48	25	35	618
water transport	718	198	366	277
air transport	1,023	320	663	457
land, other transport	2,502	1,256	2,015	2,811
communications	647	446	552	1,386
finance	9,710	7,558	9,004	9,908
insurance	558	377	519	899
business & ICT services	6,102	4,131	4,986	10,367
personal services	537	337	467	850
other services	6,202	4,704	5,613	10,083
Total	103,396	46,747	67,877	67,877

Source: GTAP9 (base year 2011)

Table B.5: Structure of Swiss Exports to USA 2011, value added basis

Million dollars

	gross exports	direct value added	direct and backward linkages	direct and forward linkages
agr forestry fisheries	9	6	8	89
other primary sectors	1	0	0	5
dairy	65	27	51	47
sugar	0	0	0	2
other processed foods	725	226	518	276
textiles and apparel	168	69	92	78
chemicals	9,060	3,241	5,312	3,246
metals and metal products	893	256	365	478
motor vehicles	148	48	64	49
other transport equipment	354	110	177	116
electrical machinery	291	118	181	135
other machinery	8,845	3,342	5,427	3,355
other manufactures	2,263	1,025	1,472	1,350
utilities	10	7	9	130
construction	9	5	7	172
water transport	34	9	18	33
air transport	299	94	194	136
land, other transport	725	364	584	827
communications	99	68	84	374
finance	548	426	508	1,228
insurance	3,861	2,607	3,593	2,729
business & ICT services	517	350	422	2,602
personal services	82	51	71	199
other services	1,216	922	1,101	2,601
Total	30,221	13,371	20,256	20,256

Source: GTAP9 (base year 2011)

Table B.6: Trade and the Structure of Swiss Economy 2011, value added basis

Million dollars (embodied value added, backward linkages)

	total value added	VA sold to Germany	VA sold to EU27	VA sold to USA	VA sold to ROW
agr forestry fisheries	5,420	48	217	8	1,354
other primary sectors	883	12	490	0	1,023
dairy	4,424	230	232	51	141
sugar	276	1	3	0	96
other processed foods	9,181	1,335	2,236	518	2,977
textiles and apparel	1,543	479	533	92	378
chemicals	27,723	9,748	16,418	5,312	13,491
metals and metal products	22,958	3,251	4,842	365	19,837
motor vehicles	921	399	352	64	165
other transport equipment	1,922	382	864	177	578
electrical machinery	3,545	453	605	181	897
other machinery	37,977	10,142	11,856	5,427	19,672
other manufactures	20,564	2,264	4,132	1,472	3,405
utilities	5,913	194	875	9	710
construction	36,090	15	35	7	47
water transport	1,061	55	366	18	263
air transport	2,407	359	663	194	580
land, other transport	20,527	1,007	2,015	584	1,216
communications	17,140	278	552	84	245
finance	41,925	675	9,004	508	1,267
insurance	16,566	460	519	3,593	1,190
business & ICT services	68,113	2,085	4,986	422	2,517
personal services	15,274	209	467	71	293
other services	267,667	1,787	5,613	1,101	3,331
Total factor income	630,020	35,868	67,877	20,256	75,672

Source: GTAP9 (base year 2011)

Table B.7: Trade and the Structure of Swiss Economy 2011, value added basis (percent of GDP)
Shares of total value added for entire economy
(embodied value added, forward linkages)

	VA total: all value added	VA sold to Germany	VA sold to EU27	VA sold to USA	VA sold to ROW	VA sold abroad total	VA sold at home
agr forestry fisheries	0.86	0.03	0.08	0.01	0.22	0.34	0.52
other primary sectors	0.14	0.00	0.04	0.00	0.08	0.12	0.02
dairy	0.70	0.03	0.03	0.01	0.03	0.10	0.61
sugar	0.04	0.00	0.00	0.00	0.01	0.02	0.03
other processed foods	1.46	0.11	0.18	0.04	0.23	0.57	0.89
textiles and apparel	0.24	0.06	0.07	0.01	0.05	0.19	0.06
chemicals	4.40	0.95	1.59	0.52	1.31	4.36	0.04
metals and metal products	3.64	0.43	0.62	0.08	2.34	3.46	0.18
motor vehicles	0.15	0.05	0.04	0.01	0.02	0.12	0.03
other transport equipment	0.31	0.04	0.09	0.02	0.06	0.21	0.10
electrical machinery	0.56	0.05	0.07	0.02	0.10	0.25	0.31
other machinery	6.03	1.00	1.17	0.53	1.94	4.63	1.40
other manufactures	3.26	0.36	0.64	0.21	0.60	1.81	1.45
utilities	0.94	0.06	0.18	0.02	0.17	0.43	0.50
construction	5.73	0.05	0.10	0.03	0.11	0.28	5.45
water transport	0.17	0.01	0.04	0.01	0.04	0.10	0.07
air transport	0.38	0.04	0.07	0.02	0.07	0.21	0.17
land, other transport	3.26	0.25	0.45	0.13	0.46	1.29	1.97
communications	2.72	0.11	0.22	0.06	0.18	0.57	2.15
finance	6.65	0.32	1.57	0.19	0.68	2.77	3.89
insurance	2.63	0.09	0.14	0.43	0.21	0.88	1.75
business & ICT services	10.81	0.81	1.65	0.41	1.40	4.27	6.54
personal services	2.42	0.07	0.13	0.03	0.12	0.35	2.07
other services	42.49	0.77	1.60	0.41	1.57	4.36	38.13
Total factor income	100.00	5.69	10.77	3.22	12.01	31.69	68.31

Source: GTAP9 (base year 2011)

C. Procurement Appendix: Estimating market access in the absence of actual data

In this annex, we describe the methodology from Shingal (2012 a) used to estimate access to procurement markets in the absence of actual data.

To estimate country i's market access in country j's procurement markets, WTO-reported contestable (above-threshold) procurement in j is first multiplied by the share of imports in total government demand in j (as reported in the GTAP data in year t). This yields estimates of j's foreign procurement, which are then multiplied by the share of i's exports in j's total imports (taken from UN Comtrade for goods trade and from the OECD for services trade) to yield an estimate of i's market access in j's procurement market. This last estimate is then disaggregated by sector according to the relative share of each sector in j's total government demand (taken from GTAP data again).

More formally:

$$\mathbf{MA_{ijkt} = [AT_{jt} * (G^{Md}_{jkt}/G^{Td}_{jkt}) * (X_{ikt}/M_{jkt})] * (G^{Td}_{jkt}/\sum G^{Td}_{jkt})}$$

where:
MA_{ijkt} = Estimate of country i's access in partner j's procurement market in sector k at time t
AT_j= Estimate of contestable public procurement in partner j
G^{Md}_{jk}/G^{Td}_{jk}= Share of imported government demand in total government demand in partner j
X_{ik}/M_{jk}= Share of country i's exports in partner j's imports
$G^{Td}_{jkt}/\sum G^{Td}_{jkt}$= Relative share of sector k in total government demand in partner j

This methodology is, however, not without its shortcomings.

Firstly, these estimates assume that the share of i's exports in j's total imports is identical for the public sector and the private sector. These estimates also assume that the composition of j's procurement from country i is identical to the composition of j's aggregate government demand. Both of these are restrictive but necessary assumptions.

Secondly, imported government demand in GTAP data does not capture the participation of foreign affiliates in procurement markets and to the extent that this participation is positive, we underestimate the value of foreign procurement in public markets. On the other hand, the GTAP data seem to grossly overstate the value of public imports. For instance, the value of the EU's public imports in GTAP data in 2007 was four times the value of public im-

ports reported in actual data submissions to the WTO for the same year! Fortunately for us though, this discrepancy is unlikely to influence our results significantly as we use the share of imported government demand in total government demand (G^{Md}_{jk}/G^{Td}_{jk}) while calculating i's market access in j's procurement markets. Assuming then that the GTAP data is equally inflated for both domestic ($G^{Td\text{-}Md}_{jk}$) and imported government demand (G^{Md}_{jk}), the shares remain unaffected.

Finally, it turns out that the estimates of government demand in GTAP (domestic as well as imported) include only consumption and not investment and this is a crucial discrepancy which is likely to underestimate foreign access especially in those sectors[83] where investment forms a significant component of total public demand. If we compare total public spending in 2007 from GTAP data (which come from Eurostat input-output tables) to Eurostat data on government spending, then from total public expenditure of €7bn, about €320 mn is public capital investment, which gives us a share of 4.5%. Assuming that half of this is defence-related expenditure, 2.25% of the total "non-defence" government budget could be in the investment account. Thus we could increase the size of public demand in "investment-heavy" sectors by 2.25% to account for the "missing" public investment demand component. This said, there is no *a priori* reason to expect public investment demand in these sectors to be met more by imports than domestically, which suggests that the magnitude of the bias in estimating market access in these sectors may not be very significant.

[83] These could include machinery, equipment, utilities, construction, repair and installation services, architectural and engineering services, land and air transport services, and sewage-disposal and sanitation services.

D. Appendix: Mapping Model Sectors to GTAP and NACE

Model sectors	GTAP codes	GTAP iso	GTAP Description	NACE R2 codes	NACE R2 description
Agriculture, forestry, and fisheries	1	**PDR**	Paddy rice	01.12	01.12 Growing of rice
	2	**WHT**	Wheat	01.11 part	01.11 (part) Growing of cereals (except rice), leguminous crops and oil seeds
	3	**GRO**	Cereal grains nec	01.11 part	01.11 (part) Growing of cereals (except rice), leguminous crops and oil seeds
	4	**V_F**	Vegetables, fruit, nuts	01.13, 01.2 (part)	01.13 Growing of vegetables and melons, roots and tubers 01.2 (part) Growing of perennial crops
	5	**OSD**	Oil seeds	01.11 part	01.11 (part) Growing of cereals (except rice), leguminous crops and oil seeds
	6	**C_B**	Sugar cane, sugar beet	01.14	01.14 Growing of sugar cane
	7	**PFB**	Plant-based fibers	01.16	01.16 Growing of fibre crops
	8	**OCR**	Crops nec	01.15, 01.11 (part), 01.2 (part)	01.15 Growing of tobacco 01.11 (part) Growing of cereals (except rice), leguminous crops and oil seeds 01.2 Growing of perennial crops
	10	**OAP**	Animal products nec	01.46, 01.47, 01.48	01.46 Raising of swine/pigs 01.47 Raising of poultry 01.48 Raising of other animals
	12	**WOL**	Wool, silkworm cocoons	01.45 (part)	01.45 Raising of sheep and goats
	13	**FRS**	Forestry	02	02 Forestry and logging
	14	**FSH**	Fishing	01.7,03	01.7 Hunting, trapping and related service activities 03 Fishing and aquaculture
Other primary	15	**COA**	Coal	05	05 Mining of coal and lignite
	16	**OIL**	Oil	06.1	06.1 Extraction of crude petroleum
	17	**GAS**	Gas	06.2	06.2 Extraction of natural gas
	18	**OMN**	Minerals nec	07, 08, 09	07 Mining of metal ores 08 Other mining and quarrying 09 Mining support service activities
Processed foods	20	**OMT**	Meat products nec	10.1, 10.2	10.1 Processing and preserving of meat 10.2 Processing and preserving of fish, crustaceans and molluscsand production of meat products
	23	**PCR**	Processed rice	10.61 (part)	10.61 (part) Manufacture of grain mill products
	19	**CMT**	Bovine meat products	10.1	10.1 Processing and preserving of meat and production of meat products

Model sectors	GTAP codes	GTAP iso	GTAP Description	NACE R2 codes	NACE R2 description
	9	CTL	Bovine cattle, sheep and goats, horses	01.42, 01.43, 01.44, 01.45 (part)	01.42 Raising of other cattle and buffaloes 01.43 Raising of horses and other equines 01.44 Raising of camels and camelids 01.45 Raising of sheep and goats
	22	MIL	Dairy products	10.5	10.5 Manufacture of dairy products
	11	RMK	Raw milk	01.41	01.41 Raising of dairy cattle
	21	VOL	Vegetable oils and fats	10.4	10.4 Manufacture of vegetable and animal oils and fats
	24	SGR	Sugar	10.81	10.81 Manufacture of sugar
	25	OFD	Food products nec	10 (remainder)	10 (remainder) Manufacture of food products
	26	B_T	Beverages and tobacco products	11, 12	11 Manufacture of beverages 12 Manufacture of tobacco products
Chemicals, pharamaceuticals, rubber, plactics	33	CRP	Chemical, rubber, plastic products	20,21,22	20 Manufacture of chemicals and chemical products 21 Manufacture of basic pharmaceutical products and pharmaceutical preparations 22 Manufacture of rubber and plastic products
	32	P_C	Petroleum, coal products	19	19 Manufacture of coke and refined petroleum products
Electrical machinery	40	ELE	Electronic equipment	26	26 Manufacture of computer, electronic and optical products
Motor vehicles	38	MVH	Motor vehicles and parts	29	29 Manufacture of motor vehicles, trailers and semi-trailers
Transport equipment other	39	OTN	Transport equipment nec	30	30 Manufacture of other transport equipment
Machinery and equipment nec	41	OME	Machinery and equipment nec	27, 28	27 Manufacture of electrical equipment 28 Manufacture of machinery and equipment n.e.c.
Metals and metal products	35	I_S	Ferrous metals	24.1, 24.2, 24.3	24.1 Manufacture of basic iron and steel and of ferro-alloys 24.2 Manufacture of tubes, pipes, hollow profiles and related fittings, of steel 24.3 Manufacture of other products of first processing of steel
	36	NFM	Metals nec	24.4	24.4 Manufacture of basic precious and other non-ferrous metals
	37	FMP	Metal products	24.5,25	24.5 Casting of metals 25 Manufacture of fabricated metal products, except machinery and equipment

Model sectors	GTAP codes	GTAP iso	GTAP Description	NACE R2 codes	NACE R2 description
Wood and paper products	30	**LUM**	Wood products	16	16 Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials
	31	**PPP**	Paper products, publishing	17, 18, 58	17 Manufacture of paper and paper products 18 Printing and reproduction of recorded media 58 Publishing activities
Other manufactured goods	27	**TEX**	Textiles	13	13 Manufacture of textiles
	28	**WAP**	Wearing apparel	14	14 Manufacture of wearing apparel
	29	**LEA**	Leather products	15	15 Manufacture of leather and related product
	34	**NMM**	Mineral products nec	23	23 Manufacture of other non-metallic mineral products
	42	**OMF**	Manufactures nec	31, 32	31 Manufacture of furniture 32 Other manufacturing
Water transport	49	**WTP**	Water transport	50	50 Water transport
Air transport	50	**ATP**	Air transport	51	51 Air transport
Finance	52	**OFI**	Financial services nec	64,66	64 Financial service activities, except insurance and pension funding 66 Activities auxiliary to financial services and insurance activities
Insurance	53	**ISR**	Insurance	65	65 Insurance, reinsurance and pension funding, except compulsory social security
Business and ICT services	54	**OBS**	Business services nec	01.6,62, 63, 68, 69-75, 77-78, 80-82	01.6 Support activities to agriculture and post-harvest crop activities 62 Computer programming, consultancy and related activities 63 Information service activities 68 Real estate activities 69-75 PROFESSIONAL, SCIENTIFIC AND TECHNICAL ACTIVITIES 77-78, 80-82 ADMINISTRATIVE AND SUPPORT SERVICE ACTIVITIES
Communications services	51	**CMN**	Communication	53, 61	53 Postal and courier activities 61 Telecommunications
Construction services	46	**CNS**	Construction	41, 42, 43	41 Construction of buildings 42 Civil engineering 43 Specialized construction activities

Model sectors	GTAP codes	GTAP iso	GTAP Description	NACE R2 codes	NACE R2 description
Personal services	55	**ROS**	Recreational and other services	55,59, 60, 90-93, 94,96, 97-98	55 ACCOMMODATION AND FOOD SERVICE ACTIVITIES 59 Motion picture, video and television programme production, sound recording and music publishing activities 60 Programming and broadcasting activities 90-93 ARTS, ENTERTAINMENT AND RECREATION 94 Activities of membership organisations 96 Other personal service activities 97-98 ACTIVITIES OF HOUSEHOLDS AS EMPLOYERS; U0NDIFFERENTIATED GOODS- AND SERVICES-PRODUCING ACTIVITIES OF HOUSEHOLDS FOR OWN USE
Other services	43	**ELY**	Electricity	35.1	35.1 Electric power generation, transmission and distribution
	44	**GDT**	Gas manufacture, distribution	35.2, 35.3	35.2 Manufacture of gas; distribution of gaseous fuels through mains 35.3 Steam and air conditioning supply
	47	**TRD**	Trade	45, 46, 47, 95	45 Wholesale and retail trade and repair of motor vehicles and motorcycles 46 Wholesale trade, except of motor vehicles and motorcycles 47 Retail trade, except of motor vehicles and motorcycles 95 Repair of computers and personal and household goods
	48	**OTP**	Transport nec	49, 52, 79	49 Land transport and transport via pipelines 52 Warehousing and support activities for transportation 79 Travel agency, tour operator and other reservation service and related activities
	45	**WTR**	Water	36	36 Water collection, treatment and supply
	56	**OSG**	Public Administration, Defense, Education, Health	37, 38, 39, 84, 85, 86-88	37 Sewerage 38 Waste collection, treatment and disposal activities; materials recovery 39 Remediation activities and other waste management services 84 Public administration and defence; compulsory social security 85 Education 86-88 HUMAN HEALTH AND SOCIAL WORK ACTIVITIES
	57	**DWE**	Dwellings		N/A

E. Appendix: Detailed Procurement Tables

Table E.1: Swiss public procurement by sector (2012)

Goods				
CPV Code	Value (€)	Number	Share in total value (%)	Share in total number (%)
14620000	4'585'947	7	0.20	0.52
14700000	3'100'306	1	0.14	0.07
15000000	340'009	2	0.02	0.15
15700000	73'308	2	0.00	0.15
18100000	851'515	2	0.04	0.15
18110000	3'971'543	1	0.18	0.07
18210000	1'044'806	1	0.05	0.07
18420000	758'234	1	0.03	0.07
18440000	202'421	1	0.01	0.07
18830000	131'728	1	0.01	0.07
18900000	926'057	1	0.04	0.07
18930000	148'680	1	0.01	0.07
19230000	129'969	1	0.01	0.07
19520000	552'914	2	0.02	0.15
22000000	2'317'393	1	0.10	0.07
22100000	539'429	1	0.02	0.07
22150000	1'133'534	1	0.05	0.07
22200000	2'665'542	1	0.12	0.07
22450000	913'907	2	0.04	0.15
22520000	189'221	1	0.01	0.07
24100000	677'657	1	0.03	0.07
24300000	205'657	2	0.01	0.15
24960000	232'170	1	0.01	0.07
30120000	25'230'685	2	1.11	0.15
30130000	472'000	1	0.02	0.07
30160000	335'457	1	0.01	0.07
30200000	15'613'800	8	0.69	0.59
30210000	18'623'563	4	0.82	0.30
30230000	14'569'943	3	0.64	0.22
31000000	688'710	2	0.03	0.15
31170000	5'021'200	5	0.22	0.37
31210000	2'659'727	2	0.12	0.15
31300000	528'640	1	0.02	0.07
31320000	8'344'815	5	0.37	0.37
31420000	1'994'552	9	0.09	0.66
31440000	5	8	0.00	0.59
31520000	2'431'434	2	0.11	0.15
31630000	395'360	2	0.02	0.15
31640000	472'000	1	0.02	0.07
31700000	2'697'143	1	0.12	0.07
31710000	674'286	1	0.03	0.07
32000000	4'397'328	2	0.19	0.15
32230000	960'363	1	0.04	0.07
32320000	1'027'049	2	0.05	0.15
32420000	19'898'895	3	0.88	0.22
32550000	15'763'536	3	0.70	0.22
32560000	560'991	1	0.02	0.07
33100000	1'880'379	2	0.08	0.15
33110000	1'507'096	3	0.07	0.22
33190000	9'168'384	3	0.41	0.22
3340000	2'335'985	1	0.10	0.07
33730000	8'399'982	1	0.37	0.07
33790000	157'783	1	0.01	0.07

Goods				
CPV Code	**Value (€)**	**Number**	**Share in total value (%)**	**Share in total number (%)**
34000000	1'399'143	1	0.06	0.07
3410000	1'225'514	2	0.05	0.15
34210000	16'920'627	2	0.75	0.15
34300000	5'845'755	5	0.26	0.37
34430000	4'531'186	1	0.20	0.07
34600000	6'730'554	5	0.30	0.37
34620000	23'076'080	3	1.02	0.22
34630000	**85'127'765**	**11**	**3.76**	**0.81**
34920000	419'350	1	0.02	0.07
34940000	8'462'902	4	0.37	0.30
34950000	793'648	1	0.04	0.07
34970000	**50'571'429**	**3**	**2.23**	**0.22**
34990000	2'362'244	1	0.10	0.07
35110000	282'514	2	0.01	0.15
35120000	938'471	2	0.04	0.15
35810000	4'409'019	2	0.19	0.15
38000000	**10'427'701**	**29**	**0.46**	**2.14**
38300000	1'583'713	3	0.07	0.22
38400000	705'327	2	0.03	0.15
38430000	6'944'891	20	0.31	1.48
38510000	4'357'635	10	0.19	0.74
38540000	972'880	3	0.04	0.22
38550000	402'549	1	0.02	0.07
38630000	1'448'939	5	0.06	0.37
38970000	739'691	1	0.03	0.07
39000000	300'510	1	0.01	0.07
39130000	1'831'360	1	0.08	0.07
39140000	10'285'588	8	0.45	0.59
39150000	427'497	3	0.02	0.22
39220000	91'838	3	0.00	0.22
39710000	176'933	2	0.01	0.15
39830000	327'147	3	0.01	0.22
42000000	267'307	1	0.01	0.07
42300000	171'100	1	0.01	0.07
42410000	6'207'359	4	0.27	0.30
42600000	650'580	2	0.03	0.15
42610000	796'500	4	0.04	0.30
42620000	378'139	2	0.02	0.15
42630000	368'473	1	0.02	0.07
42930000	150'472	1	0.01	0.07
42990000	1'407'369	3	0.06	0.22
44110000	2'739'722	2	0.12	0.15
44140000	404'571	1	0.02	0.07
44610000	852'297	1	0.04	0.07
45210000	1'618'108	3	0.07	0.22
45230000	241'405	1	0.01	0.07
48000000	4'343'946	5	0.19	0.37
48100000	8'128'505	2	0.36	0.15
48610000	260'881	1	0.01	0.07
48800000	1'918'445	1	0.08	0.07
48810000	344'710	1	0.02	0.07
48820000	5'868'180	4	0.26	0.30

Goods				
CPV Code	**Value (€)**	**Number**	**Share in total value (%)**	**Share in total number (%)**
50220000	20'228'571	3	0.89	0.22
50800000	202'286	1	0.01	0.07
51310000	957'495	1	0.04	0.07
51900000	2'372'137	2	0.10	0.15
71330000	2'621'037	1	0.12	0.07
72000000	13'504'469	7	0.60	0.52
72260000	1'530'077	2	0.07	0.15
73110000	77'589	1	0.00	0.07
73120000	77'589	2	0.00	0.15
73300000	714'878	1	0.03	0.07
79800000	3'007'790	1	0.13	0.07
9120000	403'145	1	0.02	0.07
9300000	6'177'251	1	0.27	0.07
9310000	243	1	0.00	0.07
9330000	1'321	1	0.00	0.07
98000000	897'137	1	0.04	0.07
Total	**536'514'521**	**325**	**23.71**	**24.00**

Services				
CPV Code	**Value (€)**	**Number**	**Share in total value (%)**	**Share in total number (%)**
22200000	393'333	2	0.02	0.15
24950000	1'011'429	1	0.04	0.07
31710000	7'203'489	1	0.32	0.07
32000000	5'166'780	1	0.23	0.07
32350000	539'429	1	0.02	0.07
32570000	1'194'563	1	0.05	0.07
34600000	1'011'429	1	0.04	0.07
35300000	2'360'000	1	0.10	0.07
38500000	926'469	1	0.04	0.07
45000000	**95'369'162**	**3**	**4.21**	**0.22**
45100000	821'144	1	0.04	0.07
45230000	197'434	2	0.01	0.15
48000000	3'451'881	8	0.15	0.59
48100000	1'638'514	1	0.07	0.07
48440000	968'274	1	0.04	0.07
48810000	1'011'429	1	0.04	0.07
50000000	3'813'627	3	0.17	0.22
50310000	346'731	1	0.02	0.07
50320000	723'832	2	0.03	0.15
50330000	655'414	1	0.03	0.07
50700000	1'910'388	3	0.08	0.22
50720000	402'949	2	0.02	0.15
50750000	333'245	1	0.01	0.07
50800000	744'202	2	0.03	0.15
51000000	631'363	1	0.03	0.07
55110000	554'348	2	0.02	0.15
60000000	1'430'376	8	0.06	0.59
60110000	2'173'097	3	0.10	0.22
60130000	583'717	2	0.03	0.15
63000000	53'943	1	0.00	0.07
63710000	2'767'269	1	0.12	0.07
64100000	539'429	1	0.02	0.07
64120000	796'385	1	0.04	0.07
64200000	971'096	2	0.04	0.15
64220000	13'337'371	2	0.59	0.15
66510000	3'258'354	4	0.14	0.30
70000000	2'297'620	3	0.10	0.22
71000000	**51'896'362**	**72**	**2.29**	**5.32**
71200000	165'328	1	0.01	0.07
71240000	292'085	1	0.01	0.07
71250000	1'121'650	2	0.05	0.15
71300000	**153'437'565**	**134**	**6.78**	**9.90**
71310000	18'032'329	23	0.80	1.70
71320000	30'540'904	16	1.35	1.18
71330000	9'027'284	12	0.40	0.89
71350000	1'677'459	8	0.07	0.59
71500000	1'447'925	5	0.06	0.37
71520000	292'085	1	0.01	0.07
71530000	599'951	2	0.03	0.15
71540000	9'162'469	10	0.40	0.74
71600000	540'020	2	0.02	0.15
71630000	561'839	6	0.02	0.44
71700000	277'470	1	0.01	0.07

Services				
CPV Code	**Value (€)**	**Number**	**Share in total value (%)**	**Share in total number (%)**
71730000	1'468'959	6	0.06	0.44
72000000	39'966'631	26	1.77	1.92
72200000	6'526'613	5	0.29	0.37
72210000	2'730'260	4	0.12	0.30
72220000	1'543'387	5	0.07	0.37
72240000	1'507'542	2	0.07	0.15
72250000	19'420'520	1	0.86	0.07
72260000	**194'895'573**	**90**	**8.61**	**6.65**
72310000	177'795	1	0.01	0.07
72500000	3'349'291	1	0.15	0.07
72600000	77'206	1	0.00	0.07
73000000	1'407'377	3	0.06	0.22
73100000	456'996	4	0.02	0.30
73200000	21'577	1	0.00	0.07
75100000	501'669	1	0.02	0.07
75130000	23'048'160	27	1.02	1.99
75210000	828'140	1	0.04	0.07
76300000	115'591	1	0.01	0.07
77300000	303'011	2	0.01	0.15
79000000	989'861	4	0.04	0.30
79100000	637	1	0.00	0.07
79210000	632'750	2	0.03	0.15
79300000	1'348'571	1	0.06	0.07
79320000	404'542	2	0.02	0.15
79340000	1'820'571	2	0.08	0.15
79400000	2'949'764	4	0.13	0.30
79410000	4'068'119	13	0.18	0.96
79420000	1'566'389	5	0.07	0.37
79610000	70'776	1	0.00	0.07
79620000	161'920	2	0.01	0.15
79630000	70'776	1	0.00	0.07
79710000	2'322'471	2	0.10	0.15
79950000	320'286	1	0.01	0.07
79990000	1'803'289	3	0.08	0.22
80000000	6'395'960	7	0.28	0.52
80520000	137'271	1	0.01	0.07
80530000	6'673'743	4	0.29	0.30
85000000	3'100'115	2	0.14	0.15
85100000	1'011'429	1	0.04	0.07
85140000	1'371'497	2	0.06	0.15
85310000	539'429	1	0.02	0.07
90000000	301'020	2	0.01	0.15
90500000	417'468	1	0.02	0.07
90700000	155'086	1	0.01	0.07
90710000	415'032	5	0.02	0.37
90720000	6'459'455	11	0.29	0.81
90910000	3'826'447	6	0.17	0.44
98000000	2'177'619	8	0.10	0.59
98300000	**79'682'726**	**39**	**3.52**	**2.88**
98340000	1'595'527	1	0.07	0.07
98390000	1'924'964	2	0.09	0.15
Total	**873'724'049**	**689**	**38.61**	**50.89**

Construction services				
CPV Code	**Value (€)**	**Number**	**Share in total value (%)**	**Share in total number (%)**
31000000	111'214	1	0.00	0.07
31200000	374'141	2	0.02	0.15
31210000	24'274	2	0.00	0.15
31320000	269'714	1	0.01	0.07
31500000	1'313'928	1	0.06	0.07
31600000	749'927	3	0.03	0.22
31620000	442'546	1	0.02	0.07
31680000	67'429	1	0.00	0.07
31700000	105'062	1	0.00	0.07
31710000	87'573	2	0.00	0.15
31720000	10'517'018	11	0.46	0.81
31730000	88'921	3	0.00	0.22
32320000	79'810	1	0.00	0.07
32540000	1'349	1	0.00	0.07
32560000	519'790	5	0.02	0.37
32570000	74'272	3	0.00	0.22
34000000	2'019'573	1	0.09	0.07
34920000	1'111'940	3	0.05	0.22
34970000	74'272	1	0.00	0.07
34990000	2'539'478	6	0.11	0.44
35100000	385'055	1	0.02	0.07
35120000	80'914	1	0.00	0.07
42120000	107'886	1	0.00	0.07
42520000	1'011'884	3	0.04	0.22
44140000	658'038	1	0.03	0.07
44610000	3'820'024	1	0.17	0.07
45000000	**610'989'791**	**185**	**27.00**	**13.66**
45110000	5'202'650	2	0.23	0.15
45200000	12'672'158	6	0.56	0.44
45210000	17'922'405	10	0.79	0.74
45220000	42'061'251	9	1.86	0.66
45230000	**102'904'105**	**17**	**4.55**	**1.26**
45240000	697'330	1	0.03	0.07
45260000	3'411'058	8	0.15	0.59
45300000	630'457	1	0.03	0.07
45310000	4'164'169	8	0.18	0.59
45320000	2'937'358	1	0.13	0.07
45330000	8'480'280	6	0.37	0.44
45340000	1'366'242	4	0.06	0.30
45400000	327'660	1	0.01	0.07
45410000	334'572	1	0.01	0.07
45420000	1'765'649	4	0.08	0.30
45430000	5'187'244	4	0.23	0.30
45440000	317'629	1	0.01	0.07
48100000	121'287	3	0.01	0.22
48820000	13'486	1	0.00	0.07
48920000	40'457	1	0.00	0.07
71000000	1'656'156	1	0.07	0.07
71320000	1'098'627	3	0.05	0.22
71350000	1'123'399	2	0.05	0.15
75130000	241'020	1	0.01	0.07
9000000	408'948	1	0.02	0.07
Total	**852'711'419**	**340**	**37.68**	**25.11**

Source: Swiss procurement data; own analysis.

Table E.2: Swiss public procurement by nationality of winning supplier (2012)

Value in €	CH		Share (%)		EU		Share (%)		USA		Share (%)		Others		Share (%)	
CPV Code	Value	Number	Value	Number	Value	Number	Value	Number	Value	Number	Value	Number	Value	Number	Value	Number
14620000	-	0	0	0	2'910'368	5	63	71	-	0	0	0	1'675'579	2	37	29
14700000	3'100'306	1	100	100	-	0	0	0	-	0	0	0	-	0	0	0
15000000	340'009	2	100	100	-	0	0	0	-	0	0	0	-	0	0	0
15700000	73'308	2	100	100	-	0	0	0	-	0	0	0	-	0	0	0
18100000	851'515	2	100	100	-	0	0	0	-	0	0	0	-	0	0	0
18110000	3'971'543	1	100	100	-	0	0	0	-	0	0	0	-	0	0	0
18210000	1'044'806	1	100	100	-	0	0	0	-	0	0	0	-	0	0	0
18420000	-	0	0	0	758'234	1	100	100	-	0	0	0	-	0	0	0
18440000	-	0	0	0	202'421	1	100	100	-	0	0	0	-	0	0	0
18830000	131'728	1	100	100	-	0	0	0	-	0	0	0	-	0	0	0
18900000	926'057	1	100	100	-	0	0	0	-	0	0	0	-	0	0	0
18930000	-	0	0	0	-	0	0	0	-	0	0	0	148'680	1	100	100
19230000	129'969	1	100	100	-	0	0	0	-	0	0	0	-	0	0	0
19520000	128'114	1	23	50	424'800	1	77	50	-	0	0	0	-	0	0	0
22000000	2'317'393	1	100	100	-	0	0	0	-	0	0	0	-	0	0	0
22100000	539'429	1	100	100	-	0	0	0	-	0	0	0	-	0	0	0
22150000	1'133'534	1	100	100	-	0	0	0	-	0	0	0	-	0	0	0
22200000	3'058'876	3	100	100	-	0	0	0	-	0	0	0	-	0	0	0
22450000	703'529	1	77	50	210'377	1	23	50	-	0	0	0	-	0	0	0
22520000	-	0	0	0	189'221	1	100	100	-	0	0	0	-	0	0	0
24100000	677'657	1	100	100	-	0	0	0	-	0	0	0	-	0	0	0
24300000	205'657	2	100	100	-	0	0	0	-	0	0	0	-	0	0	0
24950000	1'011'429	1	100	100	-	0	0	0	-	0	0	0	-	0	0	0
24960000	232'170	1	100	100	-	0	0	0	-	0	0	0	-	0	0	0
30120000	450'685	1	2	50	24'780'000	1	98	50	-	0	0	0	-	0	0	0

Value in €	CH		Share (%)		EU		Share (%)		USA		Share (%)		Others		Share (%)	
CPV Code	Value	Number	Value	Number	Value	Number	Value	Number	Value	Number	Value	Number	Value	Number	Value	Number
30130000	472'000	1	100	100	-	0	0	0	-	0	0	0	-	0	0	0
30160000	335'457	1	100	100	-	0	0	0	-	0	0	0	-	0	0	0
30200000	5'245'418	4	34	50	769'251	2	5	25	9'599'131	2	61	25	-	0	0	0
30210000	11'803'594	2	63	50	6'819'969	2	37	50	-	0	0	0	-	0	0	0
30230000	14'569'943	3	100	100	-	0	0	0	-	0	0	0	-	0	0	0
31000000	111'214	1	14	33	688'710	2	86	67	-	0	0	0	-	0	0	0
31170000	5'021'200	5	100	100	-	0	0	0	-	0	0	0	-	0	0	0
31200000	374'141	2	100	100	-	0	0	0	-	0	0	0	-	0	0	0
31210000	2'684'001	4	100	100	-	0	0	0	-	0	0	0	-	0	0	0
31300000	528'640	1	100	100	-	0	0	0	-	0	0	0	-	0	0	0
31320000	8'614'529	6	100	100	-	0	0	0	-	0	0	0	-	0	0	0
31420000	1'994'552	9	100	100	-	0	0	0	-	0	0	0	-	0	0	0
31440000	5	8	100	100	-	0	0	0	-	0	0	0	-	0	0	0
31500000	1'313'928	1	100	100	-	0	0	0	-	0	0	0	-	0	0	0
31520000	2'431'434	2	100	100	-	0	0	0	-	0	0	0	-	0	0	0
31600000	749'927	3	100	100	-	0	0	0	-	0	0	0	-	0	0	0
31620000	442'546	1	100	100	-	0	0	0	-	0	0	0	-	0	0	0
31630000	152'617	1	39	50	242'743	1	61	50	-	0	0	0	-	0	0	0
31640000	-	0	0	0	472'000	1	100	100	-	0	0	0	-	0	0	0
31680000	67'429	1	100	100	-	0	0	0	-	0	0	0	-	0	0	0
31700000	105'062	1	4	50	2'697'143	1	96	50	-	0	0	0	-	0	0	0
31710000	7'291'063	3	92	75	674'286	1	8	25	-	0	0	0	-	0	0	0
31720000	8'350'055	10	79	91	2'166'964	1	21	9	-	0	0	0	-	0	0	0
31730000	88'921	3	100	100	-	0	0	0	-	0	0	0	-	0	0	0
32000000	9'564'108	2	100	100	-	0	0	0	-	0	0	0	-	0	0	0

Value in €	CH		Share (%)		EU		Share (%)		USA		Share (%)		Others		Share (%)	
CPV Code	Value	Number	Value	Number	Value	Number	Value	Number	Value	Number	Value	Number	Value	Number	Value	Number
32230000	-	0	0	0	960'363	1	100	100	-	0	0	0	-	0	0	0
32320000	1'106'859	3	100	100	-	0	0	0	-	0	0	0	-	0	0	0
32350000	539'429	1	100	100	-	0	0	0	-	0	0	0	-	0	0	0
32420000	19'898'895	3	100	100	-	0	0	0	-	0	0	0	-	0	0	0
32540000	1'349	1	100	100	-	0	0	0	-	0	0	0	-	0	0	0
32550000	15'763'536	3	100	100	-	0	0	0	-	0	0	0	-	0	0	0
32560000	1'080'781	6	100	100	-	0	0	0	-	0	0	0	-	0	0	0
32570000	1'268'835	4	100	100	-	0	0	0	-	0	0	0	-	0	0	0
33100000	-	0	0	0	995'969	1	53	50	-	0	0	0	884'409	1	47	50
33110000	1'507'096	3	100	100	-	0	0	0	-	0	0	0	-	0	0	0
33190000	8'588'763	2	94	67	579'621	1	6	33	-	0	0	0	-	0	0	0
3340000	-	0	0	0	2'335'985	1	100	100	-	0	0	0	-	0	0	0
33730000	-	0	0	0	8'399'982	1	100	100	-	0	0	0	-	0	0	0
33790000	157'783	1	100	100	-	0	0	0	-	0	0	0	-	0	0	0
34000000	2'019'573	1	59	50	1'399'143	1	41	50	-	0	0	0	-	0	0	0
3410000	1'225'514	2	100	100	-	0	0	0	-	0	0	0	-	0	0	0
34210000	16'920'627	2	100	100	-	0	0	0	-	0	0	0	-	0	0	0
34300000	2'299'568	3	39	60	3'546'188	2	61	40	-	0	0	0	-	0	0	0
34430000	4'531'186	1	100	100	-	0	0	0	-	0	0	0	-	0	0	0
34600000	5'101'568	3	66	50	2'640'415	3	34	50	-	0	0	0	-	0	0	0
34620000	500'994	1	2	33	22'575'086	2	98	67	-	0	0	0	-	0	0	0
34630000	73'885'877	6	87	55	11'241'888	5	13	45	-	0	0	0	-0	0	0	0
34920000	1'531'290	4	100	100	-	0	0	0	-	0	0	0	-	0	0	0
34940000	6'355'759	3	75	75	2'107'143	1	25	25	-	0	0	0	-	0	0	0
34950000	793'648	1	100	100	-	0	0	0	-	0	0	0	-	0	0	0

Value in €	CH		Share (%)		EU		Share (%)		USA		Share (%)		Others		Share (%)	
CPV Code	Value	Number	Value	Number	Value	Number	Value	Number	Value	Number	Value	Number	Value	Number	Value	Number
34970000	50'645'700	4	100	100	-	0	0	0	-	0	0	0	-	0	0	0
34990000	2'406'040	5	49	71	2'495'681	2	51	29	-	0	0	0	-	0	0	0
35100000	385'055	1	100	100	-	0	0	0	-	0	0	0	-	0	0	0
35110000	136'699	1	48	50	-	0	0	0	-	0	0	0	145'814	1	52	50
35120000	1'019'385	3	100	100	-	0	0	0	-	0	0	0	-	0	0	0
35300000	2'360'000	1	100	100	-	0	0	0	-	0	0	0	-	0	0	0
35810000	4'409'019	2	100	100	-	0	0	0	-	0	0	0	-	0	0	0
38000000	3'141'975	10	30	34	5'698'663	15	55	52	1'587'063	4	15	14	-	0	0	0
38300000	1'306'108	2	82	67	277'604	1	18	33	-	0	0	0	-	0	0	0
38400000	-	0	0	0	705'327	2	100	100	-	0	0	0	-	0	0	0
38430000	6'403'692	18	92	90	541'199	2	8	10	-	0	0	0	-	0	0	0
38500000	-	0	0	0	926'469	1	100	100	-	0	0	0	-	0	0	0
38510000	3'449'551	7	79	70	195'037	1	4	10	713'047	2	16	20	-	0	0	0
38540000	-	0	0	0	972'880	3	100	100	-	0	0	0	-	0	0	0
38550000	402'549	1	100	100	-	0	0	0	-	0	0	0	-	0	0	0
38630000	165'065	1	11	20	1'089'477	3	75	60	194'397	1	13	20	0	0	0	0
38970000	739'691	1	100	100	-	0	0	0	-	0	0	0	-	0	0	0
39000000	300'510	1	100	100	-	0	0	0	-	0	0	0	-	0	0	0
39130000	1'831'360	1	100	100	-	0	0	0	-	0	0	0	-	0	0	0
39140000	10'285'588	8	100	100	-	0	0	0	-	0	0	0	-	0	0	0
39150000	427'497	3	100	100	-	0	0	0	-	0	0	0	-	0	0	0
39220000	91'838	3	100	100	-	0	0	0	-	0	0	0	-	0	0	0
39710000	176'933	2	100	100	-	0	0	0	-	0	0	0	-	0	0	0
39830000	327'147	3	100	100	-	0	0	0	-	0	0	0	-	0	0	0
42000000	-	0	0	0	267'307	1	100	100	-	0	0	0	-	0	0	0

Value in €	CH		Share (%)		EU		Share (%)		USA		Share (%)		Others		Share (%)	
CPV Code	Value	Number	Value	Number	Value	Number	Value	Number	Value	Number	Value	Number	Value	Number	Value	Number
42120000	107'886	1	100	100	-	0	0	0	-	0	0	0	-	0	0	0
42300000	-	0	0	0	171'100	1	100	100	-	0	0	0	-	0	0	0
42410000	6'207'359	4	100	100	-	0	0	0	-	0	0	0	-	0	0	0
42520000	1'011'884	3	100	100	-	0	0	0	-	0	0	0	-	0	0	0
42600000	650'580	2	100	100	-	0	0	0	-	0	0	0	-	0	0	0
42610000	627'929	3	79	75	168'571	1	21	25	-	0	0	0	-	0	0	0
42620000	378'139	2	100	100	-	0	0	0	-	0	0	0	-	0	0	0
42630000	368'473	1	100	100	-	0	0	0	-	0	0	0	-	0	0	0
42930000	150'472	1	100	100	-	0	0	0	-	0	0	0	-	0	0	0
42990000	1'171'369	2	83	67	236'000	1	17	33	-	0	0	0	-	0	0	0
44110000	2'739'722	2	100	100	-	0	0	0	-	0	0	0	-	0	0	0
44140000	1'062'610	2	100	100	-	0	0	0	-	0	0	0	-	0	0	0
44610000	4'672'321	2	100	100	-	0	0	0	-	0	0	0	-	0	0	0
45000000	705'505'616	185	100	99	853'337	1	0	1	-	0	0	0	-	0	0	0
45100000	821'144	1	100	100	-	0	0	0	-	0	0	0	-	0	0	0
45110000	5'202'650	0	100		-	0	0		-	0	0		-	0	0	
45200000	12'672'158	5	100	100	-	0	0	0	-	0	0	0	-	0	0	0
45210000	19'540'514	13	100	100	-	0	0	0	-	0	0	0	-	0	0	0
45220000	42'061'251	6	100	100	-	0	0	0	-	0	0	0	-	0	0	0
45230000	103'342'944	20	100	100	-	0	0	0	-	0	0	0	-	0	0	0
45240000	697'330	1	100	100	-	0	0	0	-	0	0	0	-	0	0	0
45260000	3'411'058	8	100	100	-	0	0	0	-	0	0	0	-	0	0	0
45300000	630'457	1	100	100	-	0	0	0	-	0	0	0	-	0	0	0
45310000	4'164'169	8	100	100	-	0	0	0	-	0	0	0	-	0	0	0
45320000	2'937'358	1	100	100	-	0	0	0	-	0	0	0	-	0	0	0

Value in €	CH		Share (%)		EU		Share (%)		USA		Share (%)		Others		Share (%)	
CPV Code	Value	Number	Value	Number	Value	Number	Value	Number	Value	Number	Value	Number	Value	Number	Value	Number
45330000	8'480'280	6	100	100	-	0	0	0	-	0	0	0	-	0	0	0
45340000	1'366'242	4	100	100	-	0	0	0	-	0	0	0	-	0	0	0
45400000	327'660	1	100	100	-	0	0	0	-	0	0	0	-	0	0	0
45410000	334'572	1	100	100	-	0	0	0	-	0	0	0	-	0	0	0
45420000	1'765'649	4	100	100	-	0	0	0	-	0	0	0	-	0	0	0
45430000	5'187'244	4	100	100	-	0	0	0	-	0	0	0	-	0	0	0
45440000	317'629	1	100	100	-	0	0	0	-	0	0	0	-	0	0	0
48000000	6'183'405	8	79	62	434'176	2	6	15	1'178'247	3	15	23	0	0	0	0
48100000	3'236'487	5	33	83	6'651'819	1	67	17	-	0	0	0	-	0	0	0
48440000	968'274	1	100	100	-	0	0	0	-	0	0	0	-	0	0	0
48610000	260'881	1	100	100	-	0	0	0	-	0	0	0	-	0	0	0
48800000	1'918'445	1	100	100	-	0	0	0	-	0	0	0	-	0	0	0
48810000	1'356'139	2	100	100	-	0	0	0	-	0	0	0	-	0	0	0
48820000	5'881'666	5	100	100	-	0	0	0	-	0	0	0	-	0	0	0
48920000	40'457	1	100	100	-	0	0	0	-	0	0	0	-	0	0	0
50000000	3'813'627	2	100	100	-	0	0	0	-	0	0	0	-	0	0	0
50220000	20'228'571	3	100	100	-	0	0	0	-	0	0	0	-	0	0	0
50310000	346'731	1	100	100	-	0	0	0	-	0	0	0	-	0	0	0
50320000	723'832	2	100	100	-	0	0	0	-	0	0	0	-	0	0	0
50330000	655'414	1	100	100	-	0	0	0	-	0	0	0	-	0	0	0
50700000	1'910'388	3	100	100	-	0	0	0	-	0	0	0	-	0	0	0
50720000	402'949	2	100	100	-	0	0	0	-	0	0	0	-	0	0	0
50750000	-	0	0	0	333'245	1	100	100	-	0	0	0	-	0	0	0
50800000	744'202	2	79	67	202'286	1	21	33	-	0	0	0	-	0	0	0
51000000	631'363	1	100	100	-	0	0	0	-	0	0	0	-	0	0	0

Value in €	CH		Share (%)		EU		Share (%)		USA		Share (%)		Others		Share (%)	
CPV Code	Value	Number	Value	Number	Value	Number	Value	Number	Value	Number	Value	Number	Value	Number	Value	Number
51310000	957'495	0	100		-	0	0		-	0	0		-	0	0	
51900000	2'372'137	0	100		-	0	0		-	0	0		-	0	0	
55110000	554'348	2	100	100	-	0	0	0	-	0	0	0	-	0	0	0
60000000	1'430'376	8	100	100	-	0	0	0	-	0	0	0	-	0	0	0
60110000	2'173'097	3	100	100	-	0	0	0	-	0	0	0	-	0	0	0
60130000	583'717	2	100	100	-	0	0	0	-	0	0	0	-	0	0	0
63000000	53'943	1	100	100	-	0	0	0	-	0	0	0	-	0	0	0
63710000	2'767'269	1	100	100	-	0	0	0	-	0	0	0	-	0	0	0
64100000	539'429	1	100	100	-	0	0	0	-	0	0	0	-	0	0	0
64120000	796'385	1	100	100	-	0	0	0	-	0	0	0	-	0	0	0
64200000	647'314	1	67	50	323'782	1	33	50	-	0	0	0	-	0	0	0
64220000	13'337'371	2	100	100	-	0	0	0	-	0	0	0	-	0	0	0
66510000	3'258'354	2	100	100	-	0	0	0	-	0	0	0	-	0	0	0
70000000	2'297'620	3	100	100	-	0	0	0	-	0	0	0	-	0	0	0
71000000	50'859'566	68	95	93	2'649'767	2	5	3	-	0	0	0	43'185	3	0	4
71200000	165'328	1	100	100	-	0	0	0	-	0	0	0	-	0	0	0
71240000	292'085	1	100	100	-	0	0	0	-	0	0	0	-	0	0	0
71250000	1'121'650	2	100	100	-	0	0	0	-	0	0	0	-	0	0	0
71300000	145'128'219	131	95	98	8'309'346	3	5	2	-	0	0	0	-	0	0	0
71310000	15'796'735	22	88	96	2'235'594	1	12	4	-	0	0	0	-	0	0	0
71320000	31'199'256	18	100	100	-	0	0	0	-	0	0	0	-	0	0	0
71330000	9'027'284	12	77	92	2'621'037	1	23	8	-	0	0	0	-	0	0	0
71350000	2'800'858	9	100	100	-	0	0	0	-	0	0	0	-	0	0	0
71500000	1'447'925	5	100	100	-	0	0	0	-	0	0	0	-	0	0	0
71520000	292'085	1	100	100	-	0	0	0	-	0	0	0	-	0	0	0

Value in €	CH		Share (%)		EU		Share (%)		USA		Share (%)		Others		Share (%)	
CPV Code	Value	Number	Value	Number	Value	Number	Value	Number	Value	Number	Value	Number	Value	Number	Value	Number
71530000	599'951	2	100	100	-	0	0	0	-	0	0	0	-	0	0	0
71540000	9'162'469	10	100	100	-	0	0	0	-	0	0	0	-	0	0	0
71600000	540'020	2	100	100	-	0	0	0	-	0	0	0	-	0	0	0
71630000	561'839	6	100	100	-	0	0	0	-	0	0	0	-	0	0	0
71700000	277'470	1	100	100	-	0	0	0	-	0	0	0	-	0	0	0
71730000	1'468'959	6	100	100	-	0	0	0	-	0	0	0	-	0	0	0
72000000	52'566'550	30	98	94	904'550	2	2	6	-	0	0	0	-	0	0	0
72200000	6'526'613	5	100	100	-	0	0	0	-	0	0	0	-	0	0	0
72210000	2'620'688	3	96	75	109'571	1	4	25	-	0	0	0	-	0	0	0
72220000	1'543'387	5	100	100	-	0	0	0	-	0	0	0	-	0	0	0
72240000	1'507'542	2	100	100	-	0	0	0	-	0	0	0	-	0	0	0
72250000	19'420'520	1	100	100	-	0	0	0	-	0	0	0	-	0	0	0
72260000	194'620'756	88	99	96	1'804'894	4	1	4	-	0	0	0	-	0	0	0
72310000	177'795	1	100	100	-	0	0	0	-	0	0	0	-	0	0	0
72500000	3'349'291	1	100	100	-	0	0	0	-	0	0	0	-	0	0	0
72600000	77'206	1	100	100	-	0	0	0	-	0	0	0	-	0	0	0
73000000	1'407'377	3	100	100	-	0	0	0	-	0	0	0	-	0	0	0
73100000	199'419	2	44	50	257'577	2	56	50	-	0	0	0	-	0	0	0
73110000	-	0	0	0	77'589	1	100	100	-	0	0	0	-	0	0	0
73120000	-	1	0	50	77'589	1	100	50	-	0	0	0	-	0	0	0
73200000	-	0	0	0	21'577	1	100	100	-	0	0	0	-	0	0	0
73300000	714'878	1	100	100	-	0	0	0	-	0	0	0	-	0	0	0
75100000	501'669	1	100	100	-	0	0	0	-	0	0	0	-	0	0	0
75130000	23'289'180	28	100	100	-	0	0	0	-	0	0	0	-	0	0	0
75210000	828'140	1	100	100	-	0	0	0	-	0	0	0	-	0	0	0

Value in €	CH		Share (%)		EU		Share (%)		USA		Share (%)		Others		Share (%)	
CPV Code	Value	Number	Value	Number	Value	Number	Value	Number	Value	Number	Value	Number	Value	Number	Value	Number
76300000	-	0	0	0	-	0	0	0	-	0	0	0	115'591	1	100	100
77300000	303'011	2	100	100	-	0	0	0	-	0	0	0	-	0	0	0
79000000	989'861	4	100	100	-	0	0	0	-	0	0	0	-	0	0	0
79100000	637	1	100	100	-	0	0	0	-	0	0	0	-	0	0	0
79210000	632'750	2	100	100	-	0	0	0	-	0	0	0	-	0	0	0
79300000	1'348'571	1	100	100	-	0	0	0	-	0	0	0	-	0	0	0
79320000	404'542	2	100	100	-	0	0	0	-	0	0	0	-	0	0	0
79340000	1'820'571	2	100	100	-	0	0	0	-	0	0	0	-	0	0	0
79400000	2'949'764	4	100	100	-	0	0	0	-	0	0	0	-	0	0	0
79410000	1'708'119	12	42	92	-	0	0	0	2'360'000	1	58	8	-	0	0	0
79420000	1'566'389	5	100	100	-	0	0	0	-	0	0	0	-	0	0	0
79610000	70'776	1	100	100	-	0	0	0	-	0	0	0	-	0	0	0
79620000	161'920	2	100	100	-	0	0	0	-	0	0	0	-	0	0	0
79630000	70'776	1	100	100	-	0	0	0	-	0	0	0	-	0	0	0
79710000	2'322'471	2	100	100	-	0	0	0	-	0	0	0	-	0	0	0
79800000	3'007'790	1	100	100	-	0	0	0	-	0	0	0	-	0	0	0
79950000	320'286	1	100	100	-	0	0	0	-	0	0	0	-	0	0	0
79990000	1'803'289	3	100	100	-	0	0	0	-	0	0	0	-	0	0	0
80000000	5'047'389	6	79	86	-	0	0	0	-	0	0	0	1'348'571	1	21	14
80520000	137'271	1	100	100	-	0	0	0	-	0	0	0	-	0	0	0
80530000	5'999'457	3	90	75	674'286	1	10	25	-	0	0	0	-	0	0	0
85000000	1'961'093	1	63	50	-	0	0	0	-	0	0	0	1'139'022	1	37	50
85100000	1'011'429	1	100	100	-	0	0	0	-	0	0	0	-	0	0	0
85140000	1'371'497	2	100	100	-	0	0	0	-	0	0	0	-	0	0	0
85310000	539'429	1	100	100	-	0	0	0	-	0	0	0	-	0	0	0

Value in €	CH		Share (%)		EU		Share (%)		USA		Share (%)		Others		Share (%)	
CPV Code	Value	Number	Value	Number	Value	Number	Value	Number	Value	Number	Value	Number	Value	Number	Value	Number
9000000	408'948	1	100	100	-	0	0	0	-	0	0	0	-	0	0	0
90000000	301'020	2	100	100	-	0	0	0	-	0	0	0	-	0	0	0
90500000	-	0	0	0	417'468	1	100	100	-	0	0	0	-	0	0	0
90700000	155'086	1	100	100	-	0	0	0	-	0	0	0	-	0	0	0
90710000	415'032	5	100	100	-	0	0	0	-	0	0	0	-	0	0	0
90720000	6'459'455	11	100	100	-	0	0	0	-	0	0	0	-	0	0	0
90910000	3'826'447	6	100	100	-	0	0	0	-	0	0	0	-	0	0	0
9120000	-	0	0	0	403'145	1	100	100	-	0	0	0	-	0	0	0
9300000	-	0	0	0	6'177'251	1	100	100	-	0	0	0	-	0	0	0
9310000	243	1	100	100	-	0	0	0	-	0	0	0	-	0	0	0
9330000	1'321	1	100	100	-	0	0	0	-	0	0	0	-	0	0	0
98000000	3'074'756	9	100	100	-	0	0	0	-	0	0	0	-	0	0	0
98300000	47'005'070	17	59	44	23'647'836	8	30	21	-	0	0	0	9'029'820	14	11	36
98340000	1'595'527	1	100	100	-	0	0	0	-	0	0	0	-	0	0	0
98390000	1'924'964	2	100	100	-	0	0	0	-	0	0	0	-	0	0	0
Total	**2'058'625'850**	**1185**	**91**	**89**	**173'721'308**	**113**	**8**	**8**	**15'631'885**	**13**	**1**	**1**	**14'530'672**	**25**	**1**	**2**

Source: Swiss procurement data; own analysis.

F. Detailed Sector Effects

In this annex we present a breakdown of estimated effects at sector level. This includes broad sector effects as discussed in the main report, and also more detailed estimates. As an introduction to the detailed sector estimates, we note that effects at sector level are driven by the following set of effects:

F1. For several sectors, the EU accounts for the overwhelming share of total sales as discussed in the main body of the report.
F2. Given the importance of the EU market, changes in US market access to the EU market can have a very strong impact on Swiss firms. For example, all other things equal, a 10% drop in US costs when selling in the EU puts third country firms, including Swiss firms, at a potentially substantial cost disadvantage relative to the status quo.
F3. Spillovers are critical to the sector effects. Given point 3 above, this means that if we have spillovers, sector level effects can be very different than without spillovers. Hence the impact of our T-TIP scenarios at a sector level is positive or negative, on a sector level, depending on whether we have these spillovers.
F4. Non-tariff protection is relatively high in food sectors in both the EU and US, and as such potential reduction in these costs for third countries (again from spillovers) offers potential benefits to Swiss firms in these sectors.

We start with aggregate effects for food and primary production, manufacturing, and services. Changes in output, trade, and employment are reported in Tables F-1 through F-6. A key point to carry away from these tables is that discriminatory versions of T-TIP, without an EFTA-US flanking agreement and without spillovers, are negative for Swiss industry (manufacturing and services), while to some extent food and primary production then absorb some resources from these sectors. Focusing on Scenario 3, we see that for deep agreements, spillovers give shape to the pattern of results. Hence, the pattern emphasized in the main text with respect to Figure III-15 and Figure III-16 is reinforced here. In Table F-7, we report more detailed sector output effects. These reinforce the message from Tables F-1 to F-7. For some sectors, based on points F1-F4 above, effects are quite large, and hinge almost entirely on whether or not there are spillovers. For example, with chemicals, IF there is improved market access for Swiss firms (meaning we have spillovers), given the importance of the EU market, production expands substantially under scenario 3. Without this (meaning we subtract the last column in the table) because the core discriminatory elements of the EU-US agreement scenarios under Scenarios 1, 2, and 3 hurt this sector, the total impact hinges on whether or not we have a flanking side agreement between EFTA and the US. Finally, in Figure F-1, we present a decomposition of output changes for manufacturing for two sub-categories: machinery and chemicals; and other manufacturing. This again shows how different sectors are affected differently depending on what happens in T-TIP itself (discriminatory or not, shallow or deep) and in parallel to the core agreement.

Table F-1 Changes in Swiss Output for Broad Sectors, percent

	1. tariffs only		2. tariffs, modest NTBs			3. tariffs, ambitious NTBs			
	No EFTA-US FTA	Yes EFTA-US FTA	No EFTA-US FTA	Yes EFTA-US FTA tariffs & NTBs	Yes EFTA-US FTA NTBs only	No EFTA-US FTA	Yes EFTA-US FTA tariffs & NTBs	Yes EFTA-US FTA NTBs only	of which spillovers
Food and primary	0.02	-0.07	0.05	0.45	0.53	1.10	2.26	2.35	1.10
Manufacturing	-0.30	-0.11	-0.86	0.45	0.26	0.85	3.30	3.09	2.30
Services	-0.03	-0.03	-0.12	0.16	0.16	0.34	0.90	0.90	0.55

Table F-2 Changes in Swiss Exports for Broad Sectors, percent

	1. tariffs only		2. tariffs, modest NTBs			3. tariffs, ambitious NTBs			
	No EFTA-US FTA	Yes EFTA-US FTA	No EFTA-US FTA	Yes EFTA-US FTA tariffs & NTBs	Yes EFTA-US FTA NTBs only	No EFTA-US FTA	Yes EFTA-US FTA tariffs & NTBs	Yes EFTA-US FTA only	of which, spillovers
Food and primary	0.12	-0.09	0.27	0.66	0.87	1.91	3.47	3.70	1.67
Manufacturing	-0.79	-0.33	-2.39	1.70	1.25	3.47	11.53	11.02	7.67
Services	0.76	0.19	2.01	-1.28	-0.72	-2.55	-8.77	-8.17	-5.93

Table F-3 Changes in Swiss Low Skill Employment for Broad Sectors, percent

	1. tariffs only		2. tariffs, modest NTBs			3. tariffs, ambitious NTBs			
	No EFTA-US FTA	Yes EFTA-US FTA	No EFTA-US FTA	Yes EFTA-US FTA tariffs & NTBs	Yes EFTA-US FTA NTBs only	No EFTA-US FTA	Yes EFTA-US FTA tariffs & NTBs	Yes EFTA-US FTA NTBs only	of which, spillovers
Food and primary	0.07	-0.06	0.18	0.21	0.33	0.58	0.96	1.09	0.35
Manufacturing	0.11	0.17	0.36	-0.42	-0.48	-0.97	-2.72	-2.77	-1.65
Services	-0.07	-0.09	-0.23	0.21	0.23	0.46	1.36	1.37	0.85

Table F-4 Changes in Swiss Medium Skill Employment for Broad Sectors, percent

	1. tariffs only		2. tariffs, modest NTBs			3. tariffs, ambitious NTBs			
	No EFTA-US FTA	Yes EFTA-US FTA	No EFTA-US FTA	Yes EFTA-US FTA tariffs & NTBs	Yes EFTA-US FTA NTBs only	No EFTA-US FTA	Yes EFTA-US FTA tariffs & NTBs	Yes EFTA-US FTA NTBs only	of which, spillovers
Food and primary	0.04	-0.08	0.11	0.48	0.61	1.21	2.42	2.55	1.13
Manufacturing	0.10	0.20	0.34	-0.41	-0.51	-0.95	-2.66	-2.75	-1.60
Services	-0.02	-0.04	-0.07	0.07	0.09	0.16	0.46	0.48	0.28

Table F-5 Changes in Swiss High Skill Employment for Broad Sectors, percent

	1. tariffs only		2. tariffs, modest NTBs			3. tariffs, ambitious NTBs			
	No EFTA-US FTA	Yes EFTA-US FTA	No EFTA-US FTA	Yes EFTA-US FTA tariffs & NTBs	Yes EFTA-US FTA NTBs only	No EFTA-US FTA	Yes EFTA-US FTA tariffs & NTBs	Yes EFTA-US FTA NTBs only	of which, spillovers
Food and primary	0.06	-0.06	0.17	0.37	0.49	0.96	1.78	1.90	0.77
Manufacturing	0.10	0.20	0.36	-0.43	-0.52	-0.98	-2.75	-2.83	-1.65
Services	-0.02	-0.03	-0.07	0.07	0.08	0.14	0.43	0.44	0.26

Table F-6 Changes in Swiss Imports for Broad Sectors, percent

	1. tariffs only		2. tariffs, modest NTBs			3. tariffs, ambitious NTBs			
	No EFTA-US FTA	Yes EFTA-US FTA	No EFTA-US FTA	Yes EFTA-US FTA tariffs NTBs	Yes EFTA-US FTA & NTBs only	No EFTA-US FTA	Yes EFTA-US FTA tariffs NTBs	Yes EFTA-US FTA & NTBs only	of which, spillovers
Food and primary	0.05	0.19	0.14	0.16	0.03	0.43	0.53	0.41	0.28
Manufacturing	-0.40	-0.16	-1.25	1.04	0.80	2.13	6.55	6.28	4.28
Services	-0.56	-0.13	-1.51	1.58	1.15	3.35	9.48	9.01	5.95

Table F-7 Changes in Swiss Imports for Detailed Sectors, percent

	1. tariffs only		2. tariffs, modest NTBs			3. tariffs, ambitious NTBs			
	No EFTA-US FTA	Yes EFTA-US FTA	No EFTA-US FTA	Yes EFTA-US FTA tariffs & NTBs	Yes EFTA-US FTA NTBs only	No EFTA-US FTA	Yes EFTA-US FTA tariffs & NTBs	Yes EFTA-US FTA NTBs only	of which, spillovers
agr forestry fisheries	0.04	0.01	0.10	-0.10	-0.08	-0.21	-0.63	-0.60	-0.39
other primary sectors	0.01	0.00	0.03	-0.04	-0.03	-0.08	-0.22	-0.21	-0.14
dairy	0.00	-0.08	0.10	0.69	0.77	1.85	3.71	3.80	1.88
sugar	0.03	-0.08	0.13	-0.19	-0.08	-0.48	-0.97	-0.86	-0.68
other processed foods	0.01	-0.12	0.01	0.73	0.86	1.70	3.64	3.78	1.80
textiles and apparel	0.43	1.88	1.34	0.58	-0.87	-0.55	-3.70	-5.11	-2.88
chemicals	-4.80	-3.35	-14.79	10.50	9.06	21.08	70.99	69.26	46.50
Metals and metal products	0.59	0.17	1.68	-1.86	-1.44	-3.12	-9.88	-9.44	-5.95
Motor vehicles	-1.51	-1.72	-1.30	-2.40	-2.19	-3.84	-5.13	-4.96	-2.18
Other transport equipment	0.26	-0.02	0.66	-1.20	-0.93	-2.36	-5.90	-5.62	-3.47
Electrical machinery	1.58	0.34	4.28	-4.61	-3.36	-10.22	-27.11	-25.80	-17.30
Other machinery	1.76	1.44	5.75	-3.96	-3.64	-8.13	-27.54	-27.11	-18.15
Other manufactures	1.06	1.21	3.29	-2.23	-2.37	-5.08	-16.55	-16.61	-10.81
utilities	1.27	0.25	3.48	-3.34	-2.31	-6.22	-18.98	-17.91	-12.04
Construction	-0.16	-0.09	-0.50	0.49	0.41	1.02	2.99	2.90	1.89
Water transport	0.08	0.04	0.17	0.01	0.05	0.12	-0.10	-0.06	-0.16
Air transport	0.25	0.10	0.65	-0.48	-0.34	-0.92	-3.05	-2.89	-2.00
land, other transport	0.06	0.02	0.17	-0.07	-0.02	-0.30	-0.91	-0.85	-0.58
Communications	-0.06	-0.04	-0.18	0.19	0.17	0.38	1.12	1.09	0.69
Finance	0.01	-0.02	0.00	0.09	0.12	0.20	0.40	0.43	0.19
Insurance	0.08	0.02	0.03	0.65	0.70	1.24	2.50	2.56	1.23
Business services	-0.16	-0.13	-0.52	0.37	0.34	0.73	2.49	2.45	1.62
Personal services	0.11	0.00	0.30	-0.26	-0.15	-0.50	-1.55	-1.44	-1.02
Other services	-0.06	-0.02	-0.15	0.18	0.15	0.40	1.06	1.02	0.65

Figure F-1 Decomposition of Output Changes in Manufacturing